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CHICAGO'S SHOW TELLS A SUBSTANTIAL STORY

Supplies a Sum Total of Present Growth of a Great Industry and Gives to the Commercial Vehicle Its Distinct Place

BY A. G. BATCHELDER.

CHICAGO, Dec. 5.—In a city where standards in great degree are measured by bigness, it seems perfectly logical that the most extensive and thoroughly comprehensive exhibition of automobiles ever held in this country—or abroad—should have a Middle West setting. There is no Grand Palais, nor an Olympia, in the vast overgrown town on Lake Michigan's shore, but in utilizing the Coliseum, filling the First Regiment Armory, and, finally, locating the commercial vehicles blocks away in the Seventh Regiment Armory, the idea of hugeness is accentuated and brought home with added force. Chicago may glory in the fact that it has the biggest display of automobiles ever assembled in a show, and, therefore, the National Association of Automobile Manufacturers may take pride in the housing of the Licensed and the Independent, and those who keep aloof from association connections, either of their own free will and accord or because they are not yet wanted. All that is allied to automobile construction, mostly those concerns belonging to the Motor and Accessory Manufacturers, Inc., swell appreciably and necessarily the sum total of a substantial, great and permanent industry.

GODDESS OF SPEED.

Plainly apparent is the tone of renewed optimism and unquestionably missing is that atmosphere of gloom which permeated the first New York show, unfortunate enough to come during the low-water mark of the Wall Street disturbance and continuing in lesser form during the Garden event. Out here there is a natural desire to be free from "Eastern domination"—as it is designated—and while the money mart of the metropolis has its weight throughout the entire country, its influence weakens perceptibly as it travels west; and just now there is a feeling of resentment in antagonizing it from this bustling and self-conscious town. Here the banks are known to have on hand untold millions in gold and silver and greenbacks, but they intend to have little of it go eastward until the money kings of New York loosen up, which, is the belief, will come with very little delay.

There is, however, hunks of optimism at the morning after-breakfast assembling in the lobby of the capacious Auditorium Annex, and, let it be told also, there is less of that epidemic of late wine-buying in the flashy Pompeiian room which has characterized previous shows. As the automobile "game" resolves itself into the automobile industry, there disappears and fades away, one after another, that class of salesmen who are addicted to lengthy expense accounts for "entertaining" of a recklessly generous nature.

PLEASING TRIPLE EFFECT IN THE COLISEUM.

Automobiles, with a few decreasing exceptions, are now being sold on merit alone, which brings us to remark that the weaklings are going to be weeded out somewhat precipitately during the next few months. Some good concerns with reliable products are being caught in the financial squeeze, but it is reasonable to prophesy that their affairs will be readjusted when the present temporary transition period has had its innings.

One keynote of the situation was struck by Thomas B. Jeffery when he said to a Chicago reporter, insistent upon getting something from the hard-headed, discerning, veteran manufacturer: "There is not sufficient question about the future of the automobile to warrant discussion. The automobile is just as much indicative of the progress of the present age as the trolley car, and is bound to be just as permanent. Our staple demand is for autos for utility purposes."

As the week wears on the commanding figures in the industry are appearing. Charles Clifton, the keen-sighted president of the Association of Licensed Automobile Manufacturers, reached the scene Tuesday morning, preceded the day before by Milton J. Budlong, the new general manager, whose recent accession to office has met with much approval from the Seldenites. Thomas Henderson, president of the N. A. A. M., was early in evidence; Benjamin Briscoe, chairman of the committee on management of the American Motor Car Manufacturers' Association, appeared without Alfred Reeves, the general manager, who is looking at the European shows. A roll-call now would bring a response of "Here!" from representatives of nearly every concern identified in one way or another with the industry; and many are in Chicago for the purpose of attending various sorts of conferences and meetings, the results of which may have great import and change the complexion of matters somewhat chaotic at this writing.

After the autos are sold there follow some problems for the owners, and that is why a national association of users, subdivided into State bodies and local clubs, is a valuable adjunct, not only for the owner but for the maker, who must realize that if automobiling is not made agreeable and convenient there will be less demand for his product. This is where the American Automobile Association fits into the grand scheme, to work for a national registration measure and uniform State laws, urge the improvement of the roads, supply touring information, and control racing. In William H. Hotchkiss, of Buffalo, the A. A. A. has a worthy leader, through whose efforts the membership has been increased from 8,000 to nearly 20,000 in the past nine months. The greater the number the greater will be the power of the A. A. A. and its ability to accomplish things. President Hotchkiss arrived this morning, to be present at several sessions, the news of which when announced may be worth the attention of all.

Ornamental Effects Much Admired.

Appreciation of the show decorations is outspoken on the part of the visitors, even where the latter had the advantage of being in a position to make comparisons with previous efforts in this direction. But these decorations were the despair of photographers, who were, accordingly, not enthusiastic over the extra efforts that Manager Miles had put forth to make the present show surpass anything of the kind he has done before, and that is saying a great deal, as the Chicago show has became famous for the completeness of its preparations. The most noticeable fact about the decorations, however, is that everything is in keeping—every part of the decorative scheme blends harmoniously into one attractive whole, and this, moreover, forms a most appropriate setting for the cars without in any way detracting the visitor's attention from the chief object in view: the automobile and its numerous accessories. One does not become lost in admiration of the gorgeous setting, and in doing so miss the purpose for which it is intended.

Figures fail to adequately express the extent of the task of installing such a great amount of material, and the fact that so many thousand pounds of stuff and so many thousand yards of carpet are necessary to its completion means but little to the average man, but when he has made the rounds of the three buildings he begins to have some idea of the vastness of the undertaking. Praise was forthcoming from every quarter, so that in addition to the satisfaction which accrues from the successful completion of such an achievement, Manager Miles and assistants were not long left in doubt as to the reception their work received. This was particularly the case where the oil paintings by Maratta were concerned—a feat in the decoration of a purely industrial exhibition never before attempted. In addition to the huge canvases that were suspended from the gallery railings, and which served to hide the ugliness of that part of the Coliseum's dingy ironwork in a more effective manner than was hitherto thought possible, every exhibit had its own individual background.

Three Separate Shows in All.

"Let's go over and see the other show" is the way the average visitor to the Coliseum expresses himself regarding a visit to the First Regiment Armory, which is not considered in any way as an annex, or an overflow from the main body of the show, but as a complete exhibition in itself. And such it is, for with its dozens of exhibits of complete cars and scores of accessory booths encircling the surrounding gallery, it is a complete show in itself of a size that many a large American city, outside of New York or Chicago, would be proud to boast. But the famous "pneumonia alley" of the past two years is no more. Instead of building a wooden chute through which the attendance at one building could shunt itself to the other, the wide alley itself has been roofed over with canvas and lighted, separate entrances and exits being provided at each building for the incoming and outgoing crowds. This expedient eliminated much of the confusion attendant upon the two colliding streams of humanity that characterized the wooden chute, but the practice of requiring tickets at the entrance to each occasionally brought about more or less delay and annoyance. But more than ever before is it really a case of seeing two shows for one admission, for the First Regiment Armory exhibits are fully as complete in themselves, and quite as distinctive in a way for that matter, as those at the Seventh Regiment Armory.

This, despite the fact that the Coliseum's available floor space has been stretched to the extent of accommodating fifteen additional exhibits of cars and twenty-five additional exhibits of accessories, over and above what it has been considered capable of housing in former years. This has been accomplished by utilizing a portion of the building that, under ordinary circumstances, would never have been considered as fit for the purpose, but which under the high-pressure demand for space has been converted into as attractive a part of the show as any other. This is the basement of the Coliseum annex, and, in striking contrast with the conditions prevailing below stairs in other years, the visitor does not find it essential to his comfort to get back to the main floor again as quickly as he can. In a measure, this basement overflow is also somewhat of a show in itself, for ranged down the center of the several thousand square feet of floor space thus made available is a showing of complete cars, many of them of ambitious size and attainments, and as most of them are new, well worth a little study where design and construction are concerned. Flanking them on every side, in the manner inseparably associated with all automobile shows, are the accessory exhibits ranged about the wall booths, and here again there are quite a number of new things to take the attention.

Trucks Are Thoroughly Businesslike.

It seems quite fitting and appropriate that the first thing to greet one on entering the Seventh Regiment Armory is a strong flavor reminiscent of the horse. It strikes the nostrils immediately on opening the single heavy door which bears no invitation to enter, and it is so all-pervading that it immediately gives the impression of the horse just having been led out of one door of his life-long abode to make room for the power-driven truck to come in at the other. There is another air about the Seventh Regiment Armory, once the visitor finds himself fairly inside of it, and it is one that does not strike him in the least unpleasantly. It is the quiet, businesslike air that is over everything. In fostering this first annual show for the commercial vehicle alone, the management fully realized that the man who is interested in automobile transportation wishes to learn all he can about it with the least outlay of time, or necessity for running around, and they have accordingly provided the opportunity. Tickets have only been issued upon request, apart from those special invitations sent out by exhibitors and the management to interested parties, so that while there is always an interested audience in the old horse-mart, but a sprinkling of the crowd that fills the aisles and the galleries of the Coliseum and the First Regiment Armory finds its way over to the commercial show.

But once inside he is amply repaid for the trouble, for the result of this first attempt at bringing together those makers who are now bending their efforts toward the production of what is destined to form a great part of all the automobiles turned out has more than exceeded the fondest anticipations of the promoters. One hears nothing but talk of ton-miles, overload capacities, fuel and oil consumption, cost of tire maintenance, and reliability percentage. "Investing" is the keynote of all conversation between sellers and prospective buyers.

An outbreak of fire in the Seventh Regiment Armory caused temporary excitement Tuesday, but the flames were extinguished with damage to decorations only.

IN THE SEVENTH REGIMENT ARMORY THE COMMERCIAL VEHICLE HELD ITS INITIAL EXCLUSIVE EXPOSITION.

THE FIRST AMERICAN COMMERCIAL VEHICLE EXHIBITION

By HARRY W. PERRY.

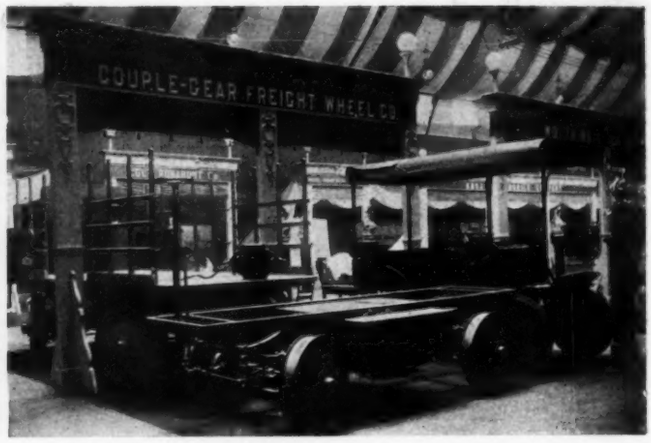
NEVER before has there been such a good opportunity to display motor trucks and delivery wagons as is offered by the first annual exhibition of Commercial Motor Vehicles that opened this afternoon at 2 o'clock in the old Tattersall's building, famous in Chicago history for its horse shows, prize fights and bicycle races but now occupied as an armory and drill hall by the Seventh Illinois Regiment. In exchange for the low, narrow subterranean passages of the basement of Madison Square Garden and the incongruous setting of Grand Central Palace and the Coliseum Annex, the builders of business wagons have this winter in Chicago been given advantages for displaying their products that are fully equal to the best that the pleasure car makers enjoy.

In spaciousness Tattersall's compares very favorably with Madison Square Garden, having a high arched roof and open floor only a little smaller in dimensions than New York's famous show place. The decorations, although less elaborate than those in the Coliseum, are more complete than could reasonably be expected and are in good keeping with the character of the event. Broad strips of alternating yellow and blue cloth are draped under the roof to conceal the steel arches and hung along the balustrade of the gallery. The floor of each exhibition space is covered with a green rug having a red border, and a band does it best to dispel the quiet that reigns while the exhibits and exhibitors await the coming of visitors. Certainly the show management has done its part toward providing a good commercial vehicle show—if the event is not the success that it should be the fact will have to be ascribed to failure of the manufacturers to make the most of the first real good chance they have ever had properly to show their vehicles under cover, or to lack of interest on the part of possible purchasers.

Several large empty spaces due to withdrawals at the last

WHERE THE RAPID AND POPE COMMERCIAL VEHICLES ARE DISPLAYED WITH TASTE, AND IN PROFUSION.

THE ONE-TON AIR-COOLED FRANKLIN WITH STAKE BODY.



HERE THE FREIGHT CARRIERS LOOK BIG AND POWERFUL

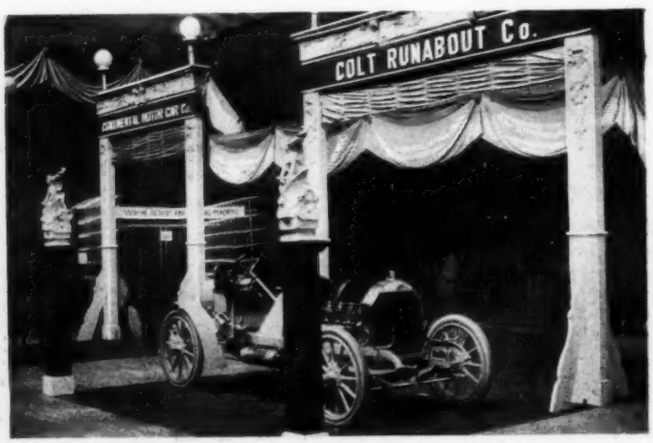
minute by exhibitors who had engaged space indicated on the opening day that the efforts of the management had not been met with the most generous reciprocal spirit. Present financial conditions are largely responsible for the withdrawals, while the delay of shipments by railroad account for some of the empty spaces. Despite the absentees, it is a good show and ought to go down in history as superior to the early automobile shows both in general tone and in sane practice in design and construction.

Although admission is free by card, the attendance on this first afternoon and night was almost nil, probably on account of bad weather and the attraction of the simultaneous show of pleasure cars and accessories in the Coliseum two blocks to the east on Wabash avenue. During the coming week there is little doubt hat out-of-town agents will drift over to inspect the commercials with a view to adding some make of delivery wagons and trucks to their lines, while business men of the city and farmers in attendance at the live stock show, which will also open during the next two weeks, will visit the show in the daytime.

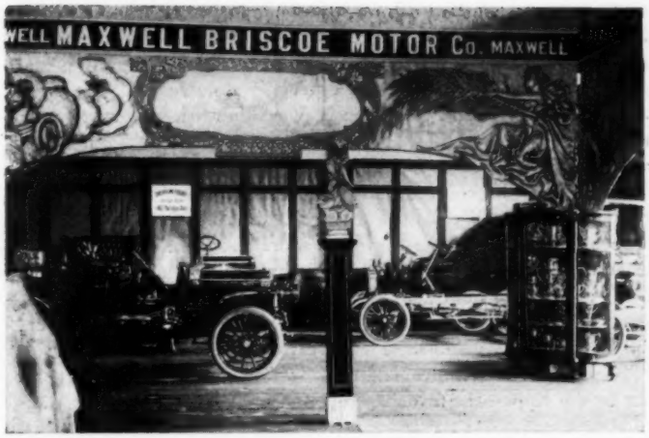
To summarize the show briefly, it may be stated that there are nineteen exhibitors of commercial vehicles whose displays were in place when the show opened, and of these four makes are electric vehicles and the rest gasoline. Eleven makes were not shown at either of the New York shows and at least two makes have never been exhibited in public anywhere before in America. One of these is the Weeks, just completed before the show by the newly organized Weeks Commercial Vehicle Company, of Chicago, and the other the Safir, just imported from Switzerland by the Commercial Motor Car Company of New York, after it had won a gold medal in the commercial vehicle trials in Berlin. Besides the displays of work vehicles, there are several exhibits of pleasure cars that could not be accommodated in the Coliseum or the First Regiment Armory on Michigan avenue. These are the Halladay seven-passenger touring car built by the Streator Motor Car Company, of Streator, Ill.; the Colt runabout made by the Colt Runabout Company, of New York, and the Pontiac buggies, built by the Pontiac Spring and Wagon Works, of Pontiac, Mich. There are eight absentees, two of whom are new makers—the Worth Motor Vehicle Company and Gifford-Pettit Manufacturing Company—while the General Vehicle Company, the White Company, Logan Construction Company, and Alden Sampson Manufacturing Company are reported to have decided not to make displays. The Buckeye Manufacturing Company (Lambert) and the Continental Motor Car Company are also notably absent. The withdrawal of the Sampson train and the White cars is unfortunate, as their absence detracts from the representative character of the show, which now has no representative of the mixed gasoline-electric or the steam classes.

The predominance of gasoline vehicles is apparent, although the four exhibitors of electrics make a strong showing, the Studebaker Automobile Company showing the largest number of machines of any single exhibitor in the building—seven, as follows: An 800-pound laundry wagon in yellow, a 1,000-pound chassis in lead, a 2,500-pound express wagon with top and curtains, painted blue, a sixteen-passenger omnibus in dark green, a 4,000-pound stake truck in green, a 7,000-pound stake truck in bright red, and a 10,000-pound stake truck in blue. Of these the first four were at the Licensed Show in New York. The Studebaker company is bringing out two new trucks to be ready in February, one of three tons capacity and the other of four tons. The Pope Motor Car Company shows three Pope-Waverley electrics—an open body express wagon in dark green, a

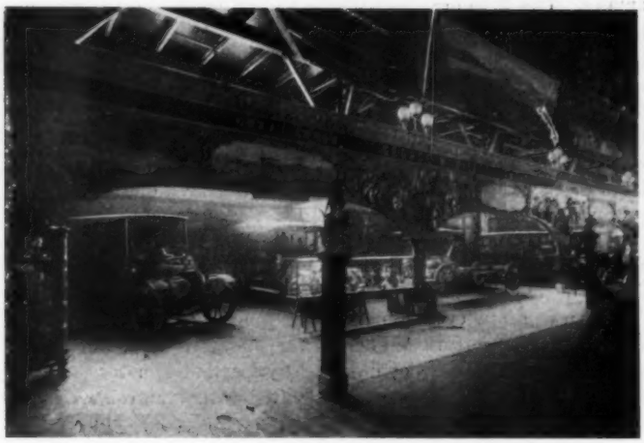
MITCHELL DISPLAY INCLUDED BOTH DELIVERY AND TRUCK.



COLT FOUND SPACE IN THE COMMERCIAL VEHICLE SHOW.



MAXWELL EXHIBIT INCLUDED A CASE OF VALUABLE TROPHIES WON.



QUIVER WHERE ALL OF THE GREAT ARROWS WERE HELD.

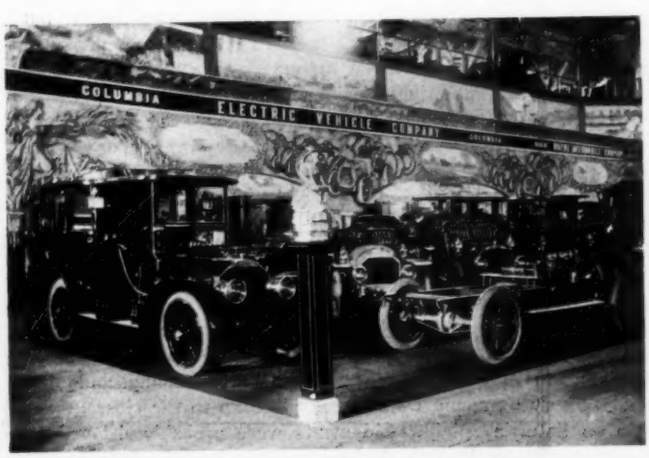
closed light delivery wagon, and a 1,500-pound express wagon with top and side curtains, the body painted bright green and the running gear red. Three electrics are also shown by the Pittsburg Motor Vehicle Company, which has not exhibited at shows during the last two years. Two of these are 750-pound closed delivery wagons and the other a 1,500-pound covered delivery wagon—one of a lot of nine that have just been completed by the factory.

All of the foregoing electric vehicles may be said to be of the conventional or standard type, the lighter wagons being driven by a single motor hung from the frame in front of the rear axle and the larger ones by double motors of General Electric, Westinghouse or Waverley manufacture, also hung from the frame and driving by double side chains to sprocket drums on the rear wheels. Batteries are underslung between the axles, and the front wheels only are employed for steering, while only the rear wheels drive. Except in the Pittsburg vehicles, the running gears are made with channel steel frames and bodies are interchangeable, so that any style desired can be fitted according to the requirements of the service. In the Pittsburg wagons the frames are made a part of the body, really constituting the sills, whereby it is claimed that a material reduction of weight in proportion to carrying capacity and mileage is secured.

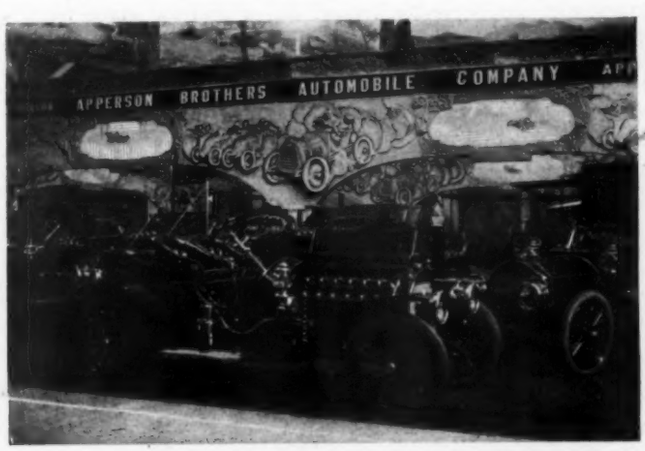
Of an entirely different type are the vehicles of the Couple-Gear Freight Wheel Company, of Grand Rapids, Mich., which has never exhibited at Eastern shows. These have the motors inside the wheels, which are made of two disks of pressed steel. One five-ton truck is shown in which all four wheels are drivers and all four are used for steering. They are fitted with the only set of sectional wood tires in the show. It may also be observed that the Couple-Gear trucks are the only vehicles on exhibition regularly equipped with steel wheels, although pressed steel wheels are shown in the gallery by the Indestructible Steel Wheel Company.

In the gasoline vehicles there is wide diversity of practice. Extensive application has been made of double opposed engines, of two-cycle operation, air cooling, friction drive and planetary transmission with the object of making the vehicles as simple and "fool-proof" as possible, it being well understood that the great majority of delivery wagon and truck drivers in America are recruited from the ranks of horse drivers. who cannot be expected to have a special training in mechanics. Thus there are five air-cooled makes of trucks—the Knox, which is shown in two models, a 1 1-2-ton open express wagon with double opposed air-cooled engine placed lengthwise underneath and driving through planetary gears to differential countershaft and side chains, and the newest three-ton model, having a vertical four-cylinder engine in front under the seat, sliding gear transmission with shaft drive to countershaft; the Frayer-Miller, shown in 5,000-pound stake and 5,000-pound express models, fitted with four-cylinder vertical engine in front, whose special feature is cooling by means of a forced draft induced by a blower driven by the engine; the Sayers & Scovill, built in Cincinnati and having also a vertical four-cylinder engine under the driver's seat, transmitting through sliding gear change-speed to countershaft; the Franklin one-ton stake truck, with four-cylinder vertical engine, and finally the new Weeks 1,000-pound delivery wagon fitted with a double opposed motor placed crosswise above the front axle under the footboard.

The Weeks car also belongs in the class of friction-drive machines, of which the Meiselbach one-ton chassis and two-ton beer wagon built by the A. D. Meiselbach Motor Wagon Company, of North Milwaukee, and the Plymouth two-ton chassis shown by the Commercial Motor Truck Company, are also ex-



AN EFFECTIVE CORNER OF THE COLUMBIA EXHIBIT.



THE DISPLAY OF APPERSONS WAS PROFUSE AND ATTRACTIVE.

amples. The Plymouth and Weeks have transmissions quite similar in appearance, comprising two parallel friction disks driven by the engine and two friction wheels between them mounted slidably on a cross shaft, from the outer ends of which chains drive to the rear wheels. In the Meiselbach, however, the continuation of the engine shaft carries two fiber cones, either of which can be forced into simultaneous contact with the beveled faces of two heavy disks mounted on jack shafts, one cone when in contact giving forward speed and the other reverse. This transmission gives no speed variations, the engine being depended upon for this, but in the other makes the friction wheels can be shifted on their shafts across the disk faces to vary speed.

Examples of two-cycle engines are found in the Weeks, Coppock and Reliance cars. Whereas the Weeks is an opposed engine set crosswise, the Coppock is a twin cylinder motor set vertically in front under the seat and fitted with removable copper water jackets, and the Reliance is of two, three and four cylinders, according to the capacity of the vehicle, and is also set vertically in front. The Reliance Motor Vehicle Company shows a two-ton express wagon with two-cylinder engine, a three-ton chassis with three-cylinder engine, and a four-ton stake truck with four-cylinder engine.

Double opposed water-cooled engines are employed in the Meiselbach and Rapid trucks, the former make having the engine set across the frame at the front and the latter having it placed lengthwise in the middle of the frame. Two machines are shown by the Rapid Motor Vehicle Company, of Pontiac, Mich. One is a truck chassis and the other a twelve-passenger stage that completed the 600-mile reliability test held this week by the Chicago Motor Club within the schedule time for touring cars.

The more conventional type of vertical four-cylinder water-cooled motor is seen in the American five-ton truck shown by the American Motor Truck Company of Lockport, N. Y.; the Plymouth, which is fitted with a Continental engine; the Mitchell, shown in express wagon and closed delivery types by the Mitchell Motor Car Company; in one model by the Reliance Company, and also in the Safir.

The Safir is the only foreign machine upon exhibition. It is shown in a four to five-ton model by the Commercial Motor Car Company of New York, which imported it from Switzerland just in time to reach the show. It recently competed in the commercial vehicle trials in Berlin and won a gold medal. It has a Saurer engine and is especially notable for two refinements that are rarely found upon even high-priced foreign touring cars. One is a self-starting device, which utilizes compressed air from a tank into which it is forced by a small compressor driven by the engine and admitted to the cylinders on the working stroke of each piston by a special distributor. The other is a device for utilizing the engine as a brake. By means of a small lever on the steering wheel the camshaft can be advanced 90 degrees in order to hold the exhaust valves closed on the scavenging stroke, thereby obtaining the resistance of compression on every up stroke of the pistons. These features are fitted to order.

The only one-cylinder engine is found in the smallest work car in the show—the Brush 500-pound delivery wagon. This has a canvas-covered body mounted on the 6-horsepower runabout chassis. The engine sets upright at the front under a hood.

A SAMPLE OF THE AUTOMOBILE ART WHICH DECORATES THE COLISEUM AND ADDS MUCH TO ITS EFFECTIVENESS.

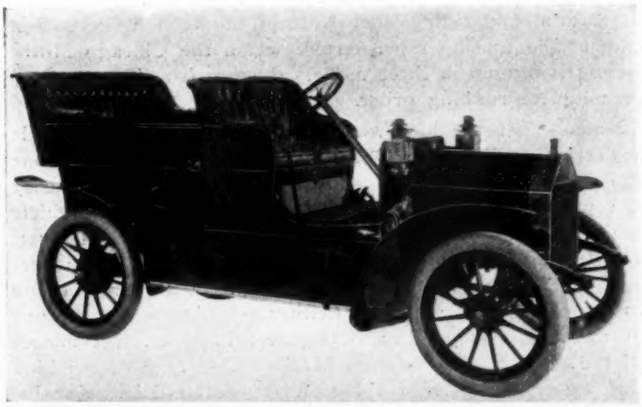
The Thomas taximeter cab, which is shown in the chassis and also complete with landaulet body equipped with a Kosmos taximeter, has a vertical four-cylinder water-cooled motor, but it departs from the conventional in having all the cylinders together with their jackets made in one casting, a further peculiarity being the enclosing of the exhaust and intake pipes in the jacket.

Very good displays of solid tires for all purposes are made in the gallery by the Diamond Rubber Company, Hartford Rubber Works Company, Morgan & Wright, Goodyear Tire & Rubber Company and Firestone Tire & Rubber Company. The Timken Roller Bearing Axle Company shows a line of massive hubs and front I beam and forged solid square rear axles, all equipped with its roller bearings. Pressed steel wheels for both light and heavy vehicles are exhibited by the Indestructible Steel Wheel Company. Exhibits of the Automobile Utilities Company, Carter Chapman & Co., Atlas Manufacturing Company and National Battery Company were not in place up to the close of the show on Saturday night. Shipments were probably delayed in other cases as well as in the case of the Automobile Utilities Company.

CARS FOR 1908 FIRST SHOWN IN A WESTERN SETTING

By CHARLES B. HAYWARD.

THOUGH it would appear at first sight that two such shows as the East fosters would be sufficient to bring out practically everything novel that the industry had to offer, and particularly this year, when Western makers were almost as a unit in taking space at New York, there has never been a time when Chicago's opening night failed to reveal a gathering of new claimants for attention, as well as a number of makers who confined their activities in this direction to the West. In previous years it was usually found to be the case that many of these of the former class



TWO-CYLINDER 24-HORSEPOWER AUBURN TOURING CAR.

were of the "here to-day and gone to-morrow" kind, and no one ever expected to hear anything further of them after the end of the show, in which they were seldom disappointed.

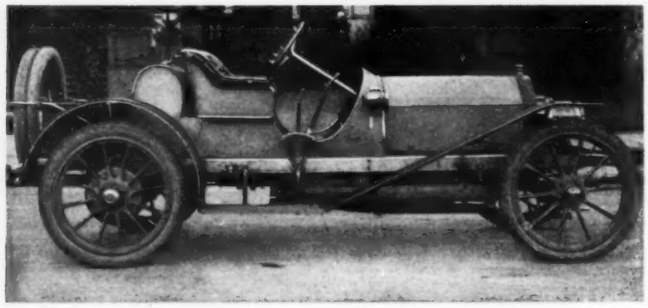
This is something in which the first-nighter at the Coliseum found a rather striking contrast to former years, for almost without exception, there is an air of substantial solidity about the new cars which shows that they are not in the experimental class and their makers are not here merely for this show alone. Another thing to strike the observer's attention is that the day when the Western maker has dropped the pastime of producing impossible freaks is likewise practically a thing of the past, although it must be added that this is something which has died hard and has hung on to a greater extent here in the Middle West than it did in New York. Naturally nothing of a revolutionary nature was to be looked for, and it is just in lacking objectionable features of this nature that most of the cars in question reveal their worth, as well as the standing of their makers.

Aerocar.—This is a line that scarcely needs any introduction to the automobile public, and if the work of reorganizing the company which is now known as the Aerocar Motor Company, Detroit, could have been expedited somewhat, the concern's new models for 1908 would have been exhibited at New York. Both air and water-cooled cars will be specialized as heretofore and practically all of the dinstinctive features which have become familar on the Aerocar during the past two years or more have been retained intact. For instance, the 4x4-inch, valves-in-the-head air-cooled motor will still be a feature of the 20-horsepower car of that type, while the special design of water-cooled motor which was brought out for the first time by the Aerocar Company a year ago will be retained on the water-cooled car, which is an unusually attractive and serviceable looking machine. Both the air and water-cooled types will be almost entirely the exclusive product of the home factory, accessories and outside parts wherever used being of the highest grade throughout. In both cases, a standard pressed-steel frame, long semi-elliptic suspension, seamless steel tubular front and rear axle, ball-bearing steering knuckles, multiple-disk clutch and sliding change-speed gear with shaft drive, are familiar items of construction which will be retained as features of the 1908 model. Both touring cars and roadsters are listed in both the air and water types.

Auburn.—In bringing out their new models for the season of 1908, the Auburn Automobile Works, Auburn, Ind., who have been building popular-priced cars ever since 1902, have fully realized that even the man who buys a low-priced car wants it to look like the standard high-priced production, and he wants this just as much as he does good materials and reliability. In consequence, they have devoted their energies to the production of a car which is representative of the highest standards of its particular type of construction, beside being a machine of most attractive appearance. The double-opposed motor measures 5 1-4 by 5 inches and is rated at 24-horsepower. A planetary change-speed gear is employed with shaft drive, control being by means of pedals, except on the high speed. The foundation of the chassis consists of a standard type of pressed-steel frame, supported on full-elliptic springs on the rear and the half-elliptic type forward. The wheelbase is 100 inches, and the wheels are 32 by 3 1-2-inch, Goodrich quick detachable tires forming the standard equipment. In fact, throughout its entire makeup only the highest grade accessories, such as the Hill Precision oiler, Schebler carbureter, Raymond brakes and the like, have been empoyed. As a five-passenger touring car, the Model G Auburn lists at $1,350, with full equipment, Model H being the same car with a special equipment of top, gas lamps, storage battery, four-inch Goodrich tires and other fittings, on which a special price is quoted. As a runabout, it is known as Model K, and lists at $1,250.

Aurora.—Long experience in the building of automobiles of the popular-priced type has confirmed the makers of the Aurora, The Aurora Motor Works, Aurora, Ill., in the opinion that for the service of the average man there is nothing to exceed the two-cylinder, horizontal type of motor. Accordingly, they provide their 20-horsepower runabout with a 4 1-2 by 5-inch motor, but it is placed under the bonnet forward with the gear-set, particular pains having been taken to make every part of the mechanism perfectly accessible. A planetary type of change-speed gear is employed, the final drive being by shaft, everything about the car being of the strongest and most durable construction to fit it for the use of the man who expects his car to run 365 days in the year with a minimum amount of expense and trouble. The

LAUTH-JUERGENS 50-H.P. "STRAIGHT CYLINDER" TYPE.



LATEST DIAMOND T RUNABOUT, MADE IN CHICAGO.

frame is of angle steel, well braced, and is supported on long semi-elliptic springs forward and a platform suspension in the rear, and these in turn are carried on a tubular front axle and an exeremely simple and efficient rear axle driving-unit. The wheelbase is 80 inches and the tread standard, tire equipment consisting of 32 by 3-inch clincher or Goodyear quick detachable tires. In complete running order the car lists $775.

Bugmobile.—Despite the title of this latest comer to the small car class, which is suggestive of a buggy type of automobile, this new car, which is the product of the Bugmobile Company, 208 Wabash avenue, Chicago, embodies many features of construction patterned after far higher-priced standards. For instance, it has an angle steel frame on which the entire power-plant and transmission are centrally located. A two-cylinder horizontal-opposed air-cooled motor of the four-cycle type is employed, in connection with a special chain type of change-speed gear, with final drive to the rear wheels from a countershaft by means of steel cables. In complete running order the car sells for $750.

C.-F.—This is the title of a new car which is the production of the Cornish-Friedberg Motor Car Company, 1233 Michigan avenue, Chicago. Though brought out during the past summer, this is the first time it makes its bow at a show stand and it does not require much study to come to the conclusion that its builders have not attempted anything radical or revolutionary, but have adhered closely to well recognized engineering practice, so that the new C-F car is really a standard production throughout. The idea of its builders has been to meet the requirements of that large class of buyers usually included under the generic title of the "average automobilist," and have accordingly concentrated far more in their 35-horsepower car at $2,250, than would have been thought possible to offer at this figure but a year or two ago. Its 35-horsepower motor is of the standard four-cylinder, four-cycle, water-cooled type, developing more than its normal rating at a comparatively low speed. A multiple disk-clutch and selective type of change-speed gear, with final drive by shaft to a floating rear axle, constitute the essentials of the transmission. As a five-passenger touring car, it has a 14-inch wheelbase and tips the scales at 2,300 pounds.

PUNGS-FINCH 45-HORSEPOWER 7-PASSENGER CAR.

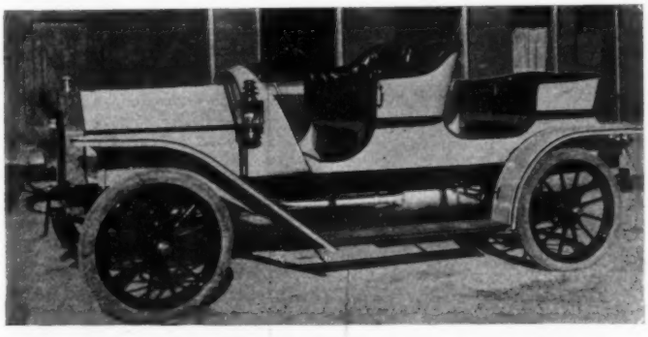
Chicago Motor Buggy.—As its name indicates, this is a machine of the now extremely popular high-wheeled type, which is the product of the Black Manufacturing Company, 124-128 East Ohio street, Chicago, but its makers have determined to bring a reliable car of this kind within the reach of a far greater number of possible users than has been the case up to the present time. It has a two-cylinder horizontal, 12-horsepower, air-cooled motor, planetary change-speed gear and double side-chain drive, Diamond block chains being used between the countershaft and the rear wheels; high-tension ignition, Kingston carbureter, wheel steer, rear-wheel brakes, angle steel frame, bevel-gear differential and many other features of much higher-priced cars of the touring type, despite which the Chicago Motor Buggy is offered in three models ranging from $375 to $575 in complete running order.

Duer.—That the high-wheeled and solid-tired automobile is destined to be the popular car of general utility, no one can doubt for a moment. It is durable, light, speedy, easy to repair and able to travel anywhere a horse-drawn vehicle can go. In bringing out their car, the makers of the Duer, The Chicago Coach & Carriage Co., 1223-31 Michigan avenue, Chicago, have kept all these requirements before them. In consequence, the Duer is neither a made-over buggy nor an assemblage of miscellaneous parts; in short, it combines all the good qualities of the high-wheeled type of machine with many of those of the standard automobile. For instance, its two-cylinder, air-cooled, 12-horsepower motor is mounted under a bonnet forward and every part of it, as well as that of the change-speed gear, which is of the selective type giving two speeds ahead and reverse, is accessible in every part. The wheels are 44-inch front and 48-inch rear, running on Timken roller-bearing axles. Semi-elliptic springs are employed forward and full-elliptic in the rear, the tire equipment being 1 1-4-inch solids. The car is capable of a speed up to thirty miles an hour, and with full equipment, including top and curtain, it lists at $750.

Lauth-Juergens.—This is one of the most powerful of the new comers to be seen at the show. It is made in two types, one with a straight cylinder and valves in the head, and the other, of the "T" head type, by the Lauth-Juergens Motor Car Company, Chicago. The former measures 5 by 6 inches and is a most powerful motor of its size, while the smaller motor of the oppositely-disposed valve type, measures 5 by 5 1-2 inches, and is rated at 45-50 horsepower. In both cases, the makers have devoted great pains to perfecting the details of the power-plant, so that upon closer observation the car is found to embody a great many distinctive features. For instance, the valves with their springs are assembled and are seated separately on the cylinder head, so as to be removable for cleaning or grinding, without disturbing any adjustment. The change-speed gear is out of special type, as is also true of the clutch; the former is of the selective, three-speed forward pattern, with but one moving member, giving the slow forward and reverse speeds. The intermediate and direct-drive pinions do not slide, being locked with a patented sliding jaw clutch, all speeds not in use at the time being locked; and it is also possible to effectively lock the gear-set at neutral. The complete clutch is composed of three parts, two of them being metal disks between which is placed a special fibre disk, having a large friction surface. Both the gear-set and clutch are so mounted that they may be removed for inspection or repair in a very short time. In other respects, the car closely follows recognized standards throughout. Final drive is by shaft to a

live rear axle, while the forward axle is a 2 1-2-inch solid forging of the "I"-beam type. The straight type motor forms the power-plant of the 50-horsepower Lauth-Juergens Tourist, which lists at $2,800 with the usual standard equipment. It has a 118-inch wheelbase, and 36 by 4 1-2-inch tires.

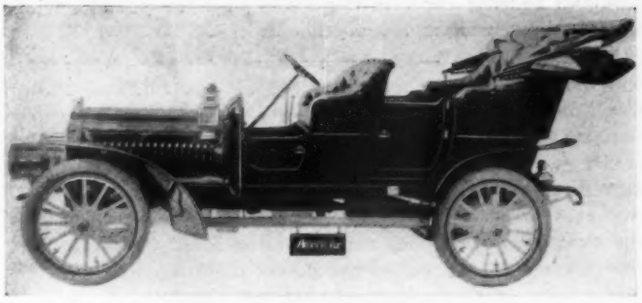
Lorraine.—This newcomer is a Chicago product that is characterized by numerous features of merit from an engineering point of view, in addition to which it embodies several points of exclusive design, and is manufactured by The Lorraine Automobile Manufacturing Company. The Model L is a 50-55-horsepower four-cylinder car with a standard four-cycle, water-cooled motor. The cylinders measure 5 by 5 inches and are offset 1 1-4 inches, beside being provided with unusually long connecting rods, the dimensions of the latter being 12 inches. The oiling system is of the simple and efficient self-contained type, the gear pump being fixed to the lower end of a vertical shaft clutched at its upper end to the lower end of the commutator shaft. The distinguishing feature of the power-plant is the Hobbs-Renault self-starter, which is of the compressed air type and is situated between the clutch and the gear-set, air being stored in a tank and maintained automatically at a pressure of 60-80 pounds, so that the apparatus is always capable of



A POPULAR PRICE WESTERN TWO-CYLINDER RUNABOUT.

starting the motor from sixteen to twenty times. The pressure pump of the starter is also used for inflating the tires. A standard conical clutch is employed in connection with a sliding gear, an option being given on the progressive or selective type of operation. Hess-Bright ball-bearings are used throughout this essential. Another distinctive and meritorious feature of the Lorraine is the Hobbs elastic shaft, consisting of a series of spring-steel rods, concentrically arranged, one end being rigidly connected to the driving element, and the other to the driven element with an intervening clutch to carry the load on a rigid shaft when the torsion of the rods reaches a fixed limit. The wheelbase is 124 inches, and Goodrich detachable tires are employed on the 36 by 4 1-2-inch running gear. In the Models M and N Lorraine cars the specifications are practically identical, with the exception of the smaller motor rated at 25-30 horsepower and smaller tires, measuring 34 by 4 inches.

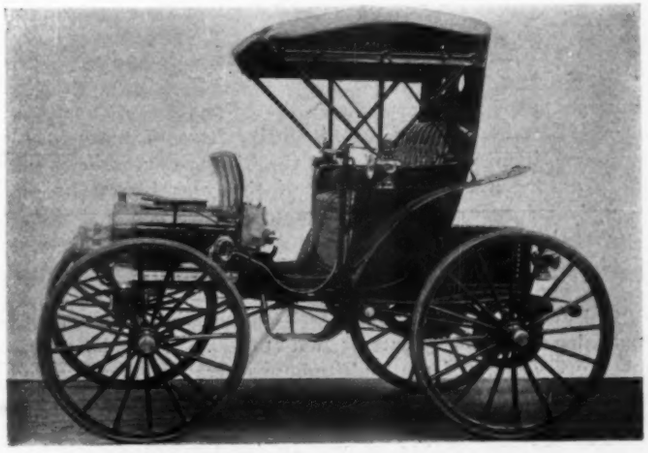
Monarch.—Although the name has been a familiar one for several years past, the Monarch car for 1908 is something entirely new, and it is quite evident at a glance that its creators, the Monarch Motor Car Company, Chicago Heights, Ill., have made a close study of the best there is in automobile design, both here and abroad, and have adopted features that have stood the test of time in thousands of cars in addition to embodying numerous special exclusive points of their own. The power plant and transmission are of the integral unit type, supported on a three-point suspension. The four-cylinder, four-cycle, water-cooled motor is rated at 40 horsepower, while the selective gear-set pro-



WATER-COOLED 40-HORSEPOWER AEROCAR.

vides three speeds forward and the usual reverse. In every line the motor follows the highest standard practice, for which the designer has shown by the many distinctive points of construction it reveals that it is an exceedingly well thought out piece of mechanism, which is produced in its entirety at the home factory. For instance, a vanadium steel crankshaft is a feature, as is also the Bosch high-tension magneto employed for ignition, not often found on a car listing at $2,500 in complete running order. The same standard chassis is equipped as a two-passenger runabout and known as Model F, while as a five-passenger touring car it is called Model G. The wheelbase is 112 inches, while the tires are 36 by 4-inch Goodyear quick-detachable type on universal rims, this also being a feature not frequently found on popular priced cars.

Oakland.—This a new car from the hands of Allanson P. Brush, who has designed it for the Oakland Motor Car Company, of Pontiac, Mich., Mr. Brush being the vice-president and consulting engineer of the company. The motor is a two-cylinder vertical water-cooled type, measuring 4 1-2 by 5 inches and is equipped with a special counter-balancing device which entirely overcomes the great disadvantage of excessive vibration, otherwise a drawback of this type of motor. It is distinguished by an exceedingly simple type of carbureter with but one moving part, the air valve, which is also simple and fool-proof. Cooling is by thermo-syphon circulation through a tubular radiator. The change-speed gear is quite novel in that it is patterned after the planetary type, the brake bands, however, being replaced by self-contained clutches which run in oil inside the housing. Another quite distinctive feature is the use of a white ash frame in place of the usual pressed-steel construction. The car is rated at 20 horsepower, and has a 96-inch wheelbase. Either 30 or 32 by 3 1-2-inch wheels will be fitted, an option being given on Diamond, Continental, Firestone or Goodrich tires. In complete running order the five-passenger



A NEW ONE OF THE BUGGY TYPE—STAVER MODEL D.

Oakland touring car hits the scales at 1,700 pounds, while the runabout weighs 100 pounds less.

Pullman "Flyer."—This is an entirely new line of cars which is being built and marketed by the Pullman Motor Car Company, 131-133 La Salle street, Chicago. While new in a sense, the Pullman "Flyer" is a composite of the best to be found in the automobile world to-day, for, as its makers state, the meritorious features of fifty of the world's best cars have been combined in it. The motor dimensions are 5 1-4 by 5 1-2 inches and its rating is 45-50 horsepower. Any further description of the power plant would simply be a repetition of those features that are generally recognized as representing the highest standard of design. The change-speed gear gives four forward speeds with a direct drive on the third, all the pinions and shafts being made of chorme nickel steel in an extremely high tensile strength, while the shafts are supported on five F. & S. annular ball bearings. A Bosch magneto of the high-tension type is a feature, the motor ignition being of the dual order, each system being entirely independent. The clutch is of the compression band type, and no less than five brakes are provided, one of them being an extremely powerful air-cooled transmission brake, operated by an emergency pedal. The car has numerous other distinctive features which it is impossible to detail here. Five models are listed, including a touring type, a "Speed car," a limousine, a special six-cylinder touring car and a special six-cylinder "Speed car," ranging in price from $3,800 to $5,000.

Pungs-Finch.—For 1908 the line turned out by Pungs-Finch Auto and Gas Engine Company, Detroit, will comprise three distinct models, all being equipped with a standard type of four-cylinder, four-cycle, water-cooled vertical motor. The smallest member of the 1908 Pungs-Finch family will be model F, a 24-horsepower, two-passenger roadster, listing at $2,000, and this is naturally a car to which the builders will devote a great deal of their attention during the coming year, owing to the extent of the demand for vehicles of this type. It has a cone clutch, selective type of sliding change-speed gear and final drive by shaft. With a 108-inch wheelbase, it tips the scales at 1,950 pounds. The model H is a 35-horsepower car which incorporates several features not found on its smaller brother. For example, it has a multiple disk type of clutch, and while most of its remaining features are similar in type to the smaller car, they naturally embody many detailed refinements. As a five-passenger touring car the wheelbase is 110 inches and the weight all on 2,300 pounds. With the usual standard equipment of tools, lamps, and the like, this car lists at $2,500 in complete running order. The largest member of the line is a 45-horsepower four-cylinder car, practically all of the essential features of which are duplicated in the machine just described, but like the last named the big car has a number of features, such as magneto ignition, not to be found on the one listing at a lower figure.

Shoemaker.—This is a car whose builders, the Shoemaker Automobile Company, Freeport, Ill., showed that they had every possible confidence in the merit of their construction by entering one of the first cars they ever built in the grueling 1,500-mile mud-plugging run of the three A tour last summer. Though its driver and designer traveled in the worst kind of hard luck throughout, he pluckily stuck at it, getting through in excellent shape, and a little study of the construction of the car as revealed at the show clearly tells the story of its enduring qualities. Two models are listed, the smaller or Model B being a 28-horsepower four-cylinder touring car, seating five passengers and listing at $2,000. Some of its distinctive features are high-tension ignition with storage batteries, disk clutch, sliding change-speed gear of the selective type, final drive by shaft and a 102-inch wheelbase, giving it a weight of 2,100 pounds all told. The Model C Shoemaker is a 40-horsepower car, listing at $2,500 in complete running order, and is intended to meet the requirements of the buyer who desires more speed, as in every other respect the same high grade material and workmanship is a feature of both.

Staver.—This new popular priced car forms an excellent example of the striking extent to which the influence of the desire of the high-priced cars has been felt by the builders of these handy vehicles. For instance, it has shackled full elliptic rear springs and half elliptic front. The 18-20-horsepower motor of the two-cylinder, horizontal, opposed type is supported on a three-point suspension and drives through a two-speed planetary change-speed gear to a countershaft, which, in turn, drives the rear wheels through half-inch Whitney roller chains of one-inch pitch. The engine bearings are Parson's white brass, with phosphor bronze in the gear-set, Timken roller bearings in the wheels and standard roller bearings on the countershaft. The engine is water-cooled by a gear-driven pump and honeycomb radiator, the fan being shaft driven. With a Stanhope body on a 78-inch wheelbase, the car lists at $1,000, complete with top, curtains, storm apron, gas and oil headlights. The Staver is made by the Staver Carriage Company, Seventy-sixth and Wallace streets, Chicago.

NEW THINGS IN THE WIDE FIELD OF ACCESSORIES

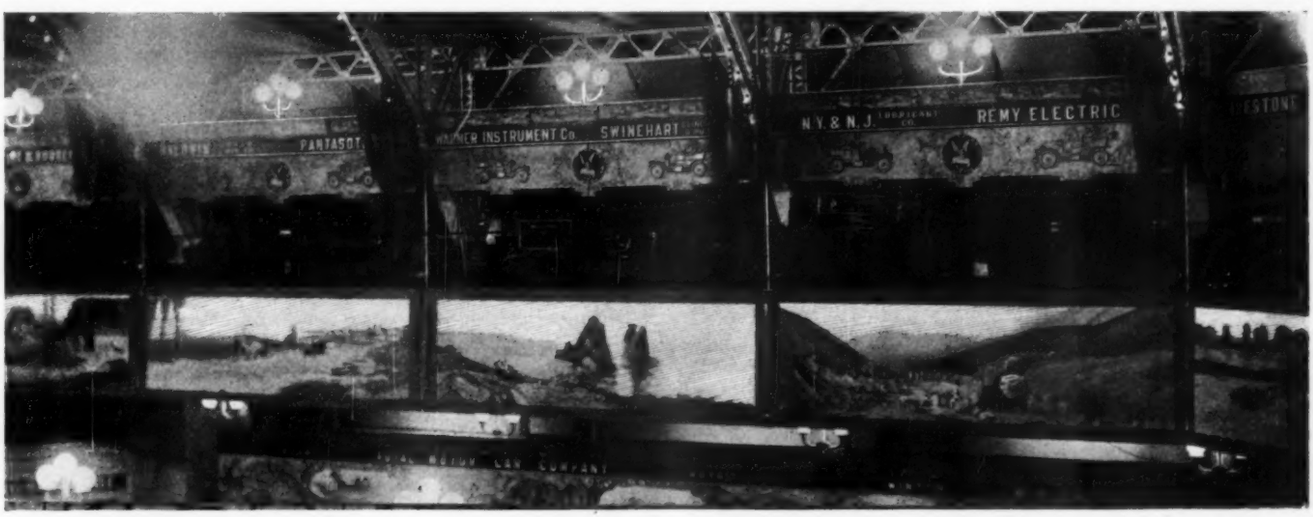
INVENTIVE imagination has always appeared to run riot in the Middle West, for each succeeding show at the Coliseum and its numerous annexes brings forth an array of ingenious accessories that is little short of marvelous. Of course, it must be added that the Chicago accessories of this year are not always those of the year before or of its predecessor, such as it is customary to see in the slightly more settled Eastern shows. Many of those highly ingenious devices seem to go the way of the majority of revolutionary appliances, whose functions are such that if they worked according to the inventor's claims, the automobilist would have nothing whatever left to do. This, however, is but one aspect of the multitudinous array of small ware exhibits that the visitor finds stowed away in every possible nook and corner of the two big buildings devoted to the pleasure car end of the show. In their ranks are to be found all the old-line makers of standard accessories, such as tires, tops, ignition apparatus, tools, lubricants and lubricating appliances, parts, clothing, and all the thousand and one things that are required by the autoist. The following are some of those whose show activities are confined to the Chicago end:

Duplex Coil Company.—For the past two or three years this concern, whose plant is located at Fond Du Lac, Wis., have been marketing a special type of induction coil for high-tension ignition. The chief feature of these coils, as their name indicates, lies in the use of a double core by means of which short primary and secondary windings are permissible. The magnetic force is correspondingly increased, allowing the use of a strong spring and light armature, which make adjustment easy, as well as eliminating much of the trouble ordinarily arising from this source. The duplex coils are built in the best possible manner throughout, and their record on the road during the time they have been on the market is a self-recommendation.

Echo Horns.—The Echo horn is a newcomer to the field

of signaling devices that is being shown for the first time in connection with the exhibit of the Excelsior Supply Company in the Armory. It is made by the Echo Horn Company, Teubusch Building, Cleveland, O., and its construction is such as to do away with the disadvantages hitherto inherent in exhaust-blown horns. It is of the three-tube type, no solder being employed and every joint being made mechanically rigid. The sounding device consists of a bronze casting, instantaneously attachable to the body of the horn, which is a second casting into the horns are tapped and screwed up tight.

Excelsior Supply Company.—There are so many things handled by such a concern as this that it is practically impossible to attempt to enumerate the many specialties they show, a large proportion of which are handled on exclusive representation in territory. A particularly novel specialty is the Mandeville steering wheel muff, made by a concern of the same name, located in Bluffton, Ind. Another is the "inner shoe," made by the Inner Shoe Tire Company, Grand Rapids, Mich., of specially stretched fabric. They also make "inner shoe patches" and "pinch-proof tube bands." In the ignition line they are handling the Fry special adjustable spark plug, made by the T. C. & W. L. Fry Company, New York. Webster gasoline gauges are also handled.



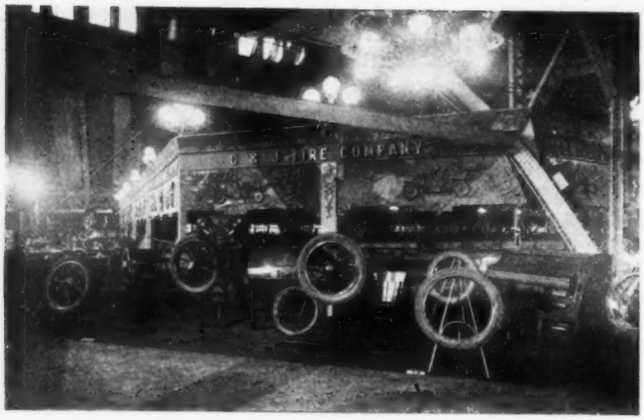
IN THE LONG GALLERIES OF THE COLISEUM THE MULTITUDE OF ACCESSORIES MAKERS SHOWED THEIR PRODUCTS.

Franco-American Auto & Supply Company.—One of the first things to take the attention of the visitor at the booth of these purveyors of all things automobile is a new compressed acetylene gas tank, which has just been brought out by the Commercial Acetylene Company, Indianapolis, Ind. It is termed the "Stereo" tank, and is the result of an effort on the part of the makers to bring a convenience of this kind down to a price point where it will be available to the owner of the small car who could otherwise not enjoy it. It is really a miniature edition of the larger tanks in most respects and has a capacity sufficient to supply the smaller headlights used on light cars for about the same length of time as its larger prototype does on the big cars with their more powerful headlights. Some of the other specialties handled by this firm are the Helmet oils, Index speedometers, Look sparking batteries, Long & Mann tire tools, Champion auto tool kits, Cincinnati portable electric drills, Amco tire holders, and numerous others.

Heitger Carbureter.—Though the new type of carbureter being marketed by the Heitger Carbureter Company, Indianapolis, Ind., was brought out some time ago, this is its initial bow at a show. It embodies numerous distinctive features that are the result of long study and continued experimenting on the part of the manufacturers, so that they are confident that the Heitger carbureter will do all that they claim for it and a little more. It is light, compact, and very accessible in every part, while its construction is such that small moving parts or fittings have been reduced to the minimum point. One of its great advantages is the sensitive control it permits on the throttle, and the makers are so certain that in this, as well as in other respects, it will demonstrate superiority, that they invite manufacturers of cars and other responsible parties to try it out on their own machines, carbureters being submitted gratis for the purpose.

Long Distance Radiators.—According to the claim of the Long Manufacturing Company, 1430-34 Michigan avenue, Chicago, there are now upwards of 22,000 of the long spiral tubing radiators in service—a fact that speaks for itself where the efficiency and durability of the type of radiator turned out by this company is concerned. Their experience in the business of radiator manufacturing dates back several years, one of their patents having been granted as early as September, 1901, while a number of others are pending. Radiators of every standard type are made, while the company is also in a position to figure on special requirements of any nature in this field. In addition, they also specialize on a most complete line of hoods, dashes and fenders of all types. Owing to their situation, they are in an excellent position to handle repair work, and accordingly maintain an excellently equipped department for this purpose.

Mandeville Steering Wheel Muff.—No one who has not had experience in driving a car in winter can fully realize what the conditions are, so that it took a driver to evolve a device that would keep the hands properly protected and still permit of freedom in handling the wheel. The inventor was W. Harry Mandeville, and his device is called the Mandeville Steering Wheel Muff, which, as its name indicates, is designed to keep the entire wheel covered, thus making it unnecessary for the driver to put his hands on the cold wood every time he turns a corner. Moreover, the muff affords a most effective protection for the wrists and forearms by keeping out the wind and drifting snow, and, what is equally important, it also prevents the latter from getting on the throttle and spark control levers and into the steering column. The muff is made of good quality leather with fur lining, and for those drivers who wish to see the position of the control levers is made with a celluloid window. While the greatest thing of the kind brought out for pleasure car drivers, it is indispensable to the truck driver, whose exposed position and slow speed



G & J TIRES WERE SHOWN IN A GOOD CORNER LOCATION.

keep him in the cold for long stretches at a time. The muffs are being manufactured by the Mandeville Steering Wheel Muff Company, Bluffton, Ind., and are also made in summer styles for bad weather.

Never-Miss Spark Plugs.—This is a plug of special construction, made with both porcelain and mica insulation, by the Never-Miss Spark Plug Company, Lansing, Mich. The name is suggestive of satisfactory ignition service on the road, at least where this essential is concerned, the makers stating that the peculiar and original construction of the Never-Miss plug does away with common plug troubles.

Pfanstiehl Laboratory.—The exhibit of this concern is one of the most attractive of the number of makers producing ignition apparatus, as in addition to their usual lines of "caterpillar flame" automobile coils their showing includes a tremendous x-ray coil in working order, and, as an estimate of this nature calls for the highest skill of the electrical apparatus manufacturer to turn out successfully, it will be evident that the presence of this monstrous coil at the booth of the Pfanstiehl Electrical Laboratory of North Chicago, Ill., has a definite bearing on the remainder of the exhibit, and is not there merely to attract the attention of the curious. In brief, it means that every Pfanstiehl unit is an x-ray coil.

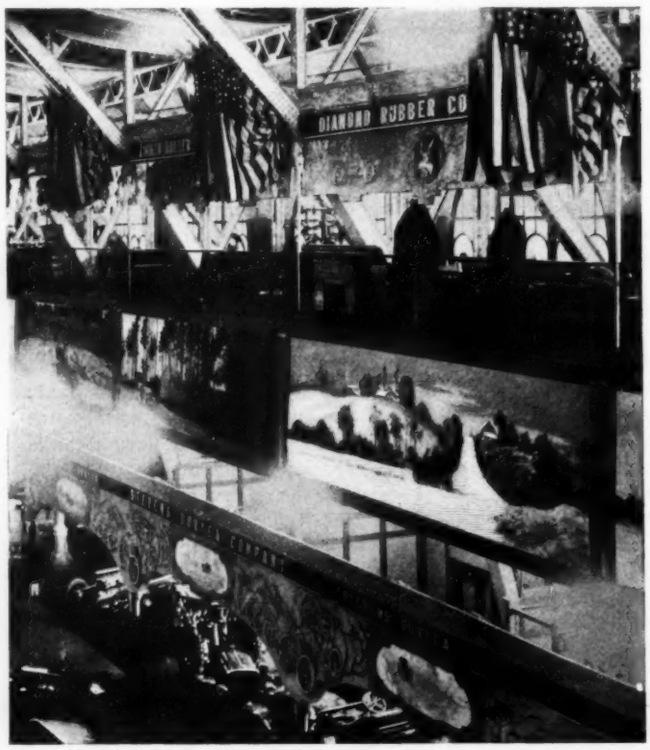
Ross Steering Gears.—The tubular type of steering gear manufactured under their patents by the Ross Gear & Tool Company, Lafayette, Ind., is of a special design, embodying many exclusive features. This is known as the Model B A and has been designed particularly to meet the demands of heavy truck and large touring car service, in which an absolute back lock is essential. The Model B B, which is of the spiral type, has the same advantages as the first named, but gives a fore and aft motion of the arm. In this design the back lock is obtained by giving the spirals on the housing a long lead. Other models of steering gears made by this firm are a lighter type of the tubular pattern, and a new form of disk steering gear known as Model B D, which constitute a radical departure from current standards.

Schilbach & Beecher Wind Shields.—It is hardly necessary to call attention to these shields as a thing particularly new because the former has been on the market for some time—long enough, in fact, to have upwards of a thousand of them in daily service. Its construction is such as to entirely do away with hinges, while another unusual advantage is the fact that the appearance of the shield is the same whether the top is up or down. It is furnished in full brass or solid mahogany with brass trimmings, and is made to fit any standard type of car on the market. The Beecher is also a most practical and easily worked shield, particularly for a low-priced article. The adjustment is by means of a small wheel on either side, which firmly holds the shield at any angle. The Voltz is another ingenious and simple shield made by this concern, the Limousine Carriage Mfg. Co., Michigan avenue and Thirty-fifth street, Chicago.

Visor Hood and Muffler.—It is not often that a single article of apparel can be put to the manifold uses of which the new Visor Driving Hood and Muffler is capable. It is made of hand-knitted pure wool throughout and can be used as a neck-muffler and chest-protector, as a driving hood, face protector, or as a sleeping cap, any of the changes being readily effected in a few minutes without the aid of another person, and without using any outside attachments, two fasteners keeping it in place regardless of the manner in which it is employed. It is made by the Visor Knitting Company, Niagara Falls, N. Y., and Toronto, Ont.

Vivax Storage Batteries.—These light accumulators are the result of several year's experimenting, with a view to the production of a battery specially designed both for ignition and electric vehicle use, in which the requirements are unusually severe, although the makers, the Vivax Storage Battery Company, 2224-2234 Michigan avenue, Chicago, also produce large cells for central station use. For ignition work they are made in sizes suitable for two, four, or six-cylinder cars, and with a properly adjusted coil not taking more than .75 ampere, will give a mileage of 1,200 to 1,500 on a single charge, while for limousine lighting they will burn three four-candle power, six-volt lamps.

Warner Clutch Company.—It took the automobile designer quite some time to realize that the character of the clutch employed on a car had a very vital influence on the life of the gear-set, and this is one of the things that the makers of the Warner clutch, the Warner Clutch Company, 1461 Michigan avenue, Chicago, have borne in mind in perfecting their device. Elimination of shocks in starting is absolutely essential to this end, and the fault with early devices was that the necessary slippage could not be obtained without damaging the clutch itself. It is also of the greatest importance that the clutch should release instantly, and both in this and the matter of slippage the Warner clutch has been brought to a high state of efficiency.



DIAMOND TIRES AND TIMKEN BEARINGS WERE NEIGHBORS.

Three Days of Automobile Endurance

By C. B. Hayward

LOCOMOBILE LEAVING ON ITS LONG PLUG THROUGH WESTERN MUD.

CHICAGO, Dec. 1.—Ten sturdy automobiles actually met all reasonable conditions in the strenuous three-day, 600-mile reliability test of the wideawake Chicago Motor Club, but its technical committee finally succeeded, by a process of elimination, in reducing the survivors to the trio who were awarded the Miles, Goodrich, and New Southern Hotel trophies.

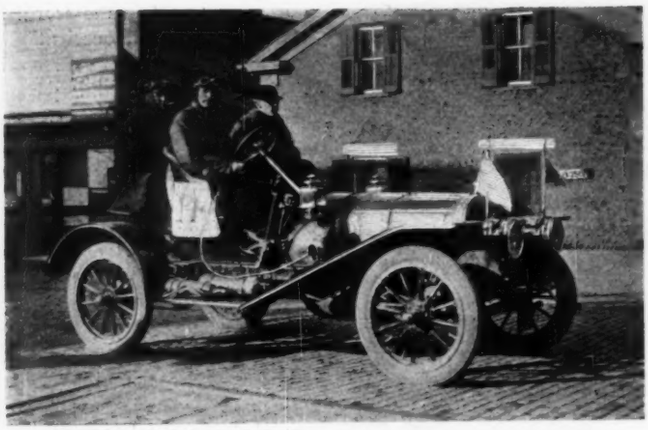
A Haynes runabout, driven by Frank Nutt, escaped without a flaw, thus securing the Miles trophy; the Pierce six-cylinder, tooled by Arthur Kumpf, with but two points to its discredit, gained the Goodrich silver set, a loose grease cup on the rear axle being its undoing, and an Oldsmobile, driven by Ralph Owen, was charged with six points for having "a driving shaft boot loose" and an "emergency brake, medium," but gained the hotel cup.

The test was really a two-part one, and the practice of appointing competing observers made the supervision on the road no less thorough than that applied to the cars by the hard-working committee when they undertook the task of examining them to ascertain the condition the three arduous journeys had left them in. The cars were placed according to price in three different classes: A, B, and C, and were called upon to make an average of 20, 17, and 14 miles an hour, respectively.

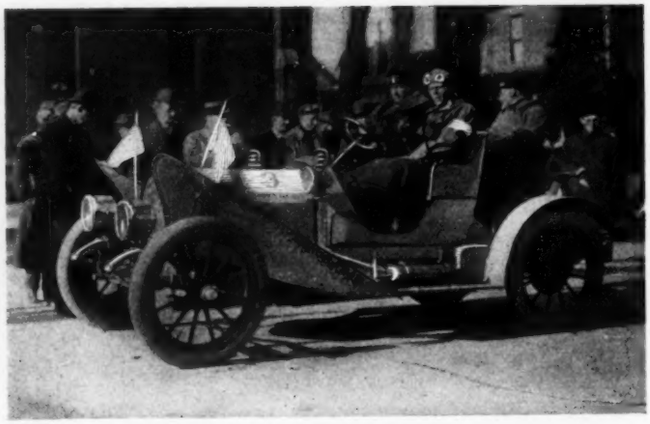
Every time the driver had to halt or leave his seat the hawk-eyed observer was his shadow, so that by the end of the three days' work on the road more than two-thirds of the competitors had piled up so many demerits that they had eliminated themselves from all further consideration. First come the ten who survived with flying colors, seven of which later fell outside the prize list beneath the close scrutiny of the technical committee, although it seems unfortunate that accessories should have been allowed to play such a prominent part in the scoring. After three days' conscientious work on the road, with a record which would under ordinary conditions have earned a perfect score certificate, it was disappointing to the contestants to find that they had to descend from their proud position because of some such trifling matter as loose or broken lamp, speedometer or horn. All recognize the value of the technical examination at the end of the run, for under the old régime too many ruined cars have struggled practical wrecks to the finishing line and earned equal honors with the strong and sturdy. It is just here that discrimination was needed, stereotyped rules being altogether incapable of meeting every contintingency. The public wants to know just these facts revealed by the committee's examination, but drivers were certainly entitled to more consideration. Herewith is the list of participants and the official order in which they concluded:

No.	Car	H.P.	Cylinders	Class	Tires	Driver	Points Charged
14	Haynes	30	4	B	Diamond	F. Nutt	0
29	Pierce	40	6	A	Goodrich	A. Kumpf	2
30	Oldsmobile	38	4	B	Diamond	R. Owen	6
3	Rambler	32	4	B	Goodrich	T. Collier	8
18	Auburn	24	4	C	Goodrich	R. Parker	10
23	White	30	.	B	Goodrich	W. Leitch	12
33	Locomobile	40	4	A	Fisk	W. Mitchell	14
20	Studebaker	30	4	B	Diamond	W. Smith	16
28	Kisselkar	35	4	B	Goodrich	W. Jay	18
36	National	50	4	A	Diamond	J. Aitken	26
32	Silent-Knight	35-40	4	A	Firestone	D. Kilbourne	54
2	Pierce-Arrow	40	6	A	Goodrich	P. Hoffman	55
11	Jackson	20-24	2	C	Healy	F. Holmes	66
34	Locomobile	40	4	A	Fisk	F. Leiser	67
12	Autocar	30	4	B	Fisk	Barney Oldfield	74
35	Premier	24	4	B	Michelin	R. MacNamara	78

WHERE THE TURN WAS MADE IN SOUTH BEND FOR FIRST DAY'S RUN.



HAYNES, WHICH OBTAINED THE ONLY PERFECT SCORE.



FOURTH POSITION WAS GALLANTLY WON BY RAMBLER.

15	Dragon	24	4	B	Diamond	John Haynes	90
9	Stod.-Dayton	50	4	A	Goodrich	C. Englebeck	107
24	White	20	.	B	Diamond	C. Denzer	110
22	White	30	.	A	Diamond	Hal Sheridan	137
8	Stev.-Duryea	50	6	A	Fisk	C. Clark	186
16	Rapid	25	2		Firestone	F. Grogan	188
5	Wayne	30	4	B	Morgan & W.	F. Gremel	620
25	Reo	18-20	2	C	Michelin	M. Vandecar	1,040
13	Maxwell	20	2	C	Goodrich	O. Klose	1,108
31	Pierce-Racine	40	4	B	Goodyear	J. Hanson	Out 3rd day
6	Matheson	50	4	A	Diamond	R. Smith	Out 3rd day
7	Matheson	50	4	A	Diamond	D. Buck	Out 2nd day
1	Royal Tourist	45	4	A	Diamond	R. Cook	Out 1st day
26	Matheson	35	4	A	Diamond	J. Heineman	Out 1st day
10	Jackson	20-24	2	C	Healy	E. Scheifler	Out 1st day
17	Frayer-Miller	50	4	A	Diamond	J. Barnes	Out 1st day
19	Marion	24	4	B	Michelin	C. Price	Out 1st day
21	Thomas	60	4	A	Goodrich	C. Coey	Out 1st day
27	Stod.-Dayton	50	6	A	Goodrich	B. Payne	Out 1st day

How the Test Was Conducted.

The three days' test was split into three sections: going to South Bend, Ind., and back the first day, a distance of 221 miles; to Rockford, Ill., and back, 190 miles, the second day, and to Ottawa, Ill., and back, 205 miles, the third day. The rules prevented any repairs or replacements without penalties and everything possible on the car was sealed. Observers nominated by the factories were used. The technical committee consisted of David Beecroft, F. E. Edwards and Berne Nadal, assisted by Frank H. Trego. Referee was F. C. Donald, president Chicago M. C.

Placing competing observers on all the cars resulted in lynx-eyed supervision during every moment of the running, while the cars were locked up between each day's run and after the final. Friday afternoon the technical committee, which had worked continuously for three days and nights, undertook the task of ascertaining the condition of the claimants with pretensions to perfect scores. This consisted of subjecting the cars to a searching examination and penalizing them for defects according to the schedule adopted. This was as follows:

Front and rear axles.—There will be no penalty when the spread of the wheels is less than 1-2 inch; for each 1-2 inch or fraction in excess, five points.

Springs.—Sag of one inch permitted without penalization. For each additional 1-4 inch or fraction thereof, five points.

Frame.—For each 1-4 inch or fraction thereof, 15 points.

Steering Knuckles.—For each 1-8 inch variation or fraction thereof, 10 points.

Motor Test.—One or more cylinders missing in a two-block test, 50 points.

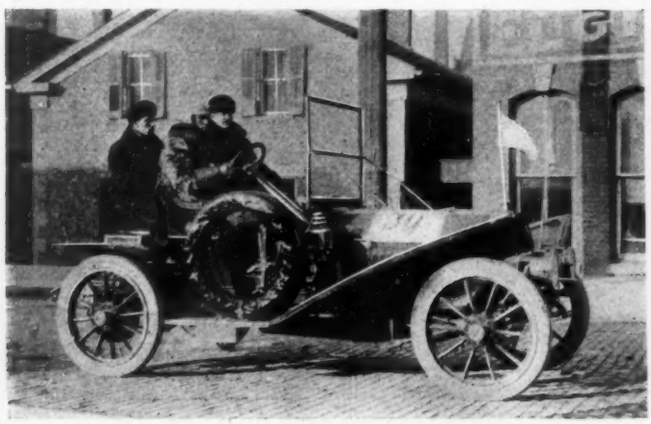
Brakes.—Failure to stop car within reasonable bounds, 30 points.

Transmission.—Failure to drive on different forward and reverse speeds, 50 points.

Clutch.—Perceptible slipping, 30 points.

It will be recognized that the above rules were most admirably framed to demonstrate the fitness of a car to survive such a test, but, as has almost invariably been the case in the past, so many cars have demonstrated such fitness in no uncertain degree that the committee found themselves extremely hard put to it to devise some way of eliminating. Consequently, although it was understood at the outset that the rules applied both to the car's equipment as well as to its mechanism, the construction put upon them was such as it would be found difficult to read into the regulations, though it must be added that in their application the committee was consistent throughout. For instance, Sheridan's White steamer was penalized six points for having a side lamp perceptibly loose, and right here is where the committee might have exercised its own judgment in the matter rather than trust to the competing drivers. Upon the discovery of such a defect the driver was called and asked how long it would take to make good the repair, the penalty being based on his answer, and as the answers varied as widely as the poles, so did the penalties for equally trivial adjustments.

For instance, Arthur Kumpf, the juvenile driver of the Pierce



OWEN MADE THE OLDSMOBILE A CLOSE THIRD.

THE LITTLE AUBURN WAS ALWAYS RELIABLE AND STEADY.

Great Arrow Six said it would take half a minute to turn down a grease cup on the differential housing, but which did not need turning down anyway. This placed a black mark against his otherwise clean score, and it must be added that the big Pierce had gone over the course twice, so that its test was nearer 1,300 miles than 600. "Ted" Collier's Rambler was assessed one minute or two points for losing the red lens out of the tail-lamp. Leitch's White steamer, No. 23, was assessed no less than six points merely on account of a cut apron lacing which had suffered from a gravel pile on the road. John Haynes' Dragon had a loose engine pan and Ralph Owen's Oldsmobile suffered 2 1-2 minutes for a small set screw loose in the universal joint housing. These last, it will be noted, were purely mechanical troubles and well within the scope of the regulations, as were also those more serious ones, such as the bent front axle on the Stevens-Duryea "Big Six," which occurred early in the trials, and which it was evident to all would penalize the car in spite of its perfect running record, much of which was made under this serious handicap; and navigating Illinois roads at speed is not child's play, even with a perfect car.

SUCCESSFUL PIERCE, WITH ITS YOUTHFUL DRIVER AND BIG HAPPY FAMILY.

Instances of the first sort multiplied themselves indefinitely, so that practically the entire afternoon was spent in the examination of the cars, and but few of them were given their round-the-block test to be weighed in before darkness settled down, while the committee wrestled with the problem of coming to a satisfactory basis of judging at their headquarters in the New Southern until a late hour Friday night. Next morning they went at the task again and last night the decisions were made known at the show.

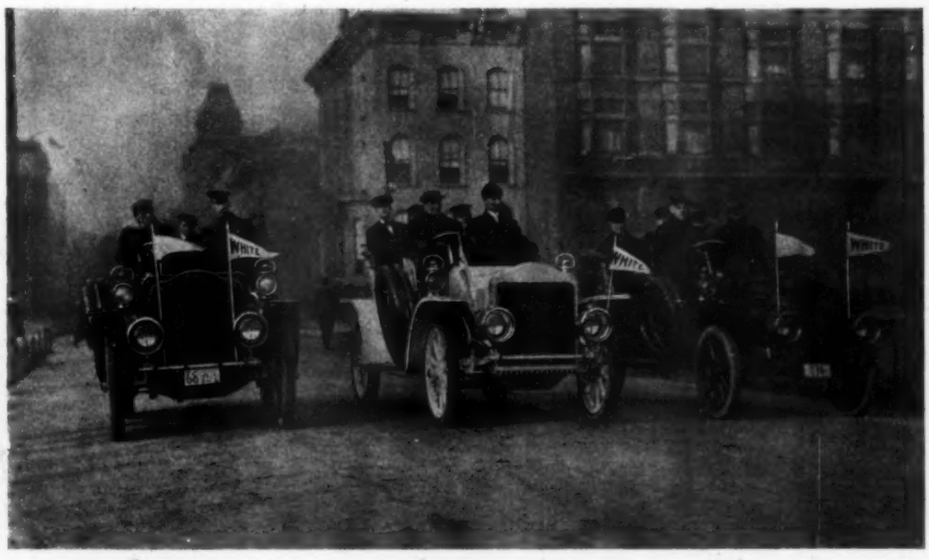
Story of the First Day's Run.

As a curtain raiser the worst route between Chicago and South Bend was selected, and as the distance was 230 miles for the day's running, it was evident that the committee was determined to begin the weeding out process as early in the game as possible. Many of the competitors helped this plan along by starting out with such a slam, bang dash style of running that they eliminated themselves. C. A. Coey, driving the Thomas Flyer, settled his chances before he got beyond the Chicago city line, going into the ditch at One Hundred and Twenty-seventh street and Michigan avenue, while traveling at high speed. His observer, R. I. Eads, of the Premier company, was scratched up a bit, and C. E. Gregory, treasurer of the Chicago Automobile Club, who was a passenger, catapulted through the air, but landed safely. Before traveling 25 miles, R. W. Cook's Royal Tourist broke its rear axle, but Cook never said die and jumped on the first train, bringing back a new axle with him, causing a loss of 4 hours 45 minutes, half of which was made up before the end of the day. C. W. Price's Marion had axle trouble also, while the Frayer-Miller, driven by J. Barnes, cracked its frame, thus making a total of four cars wholly eliminated on the first day.

Those who participated in last summer's A. A. A. tour have reason to remember the roads between South Bend and Chicago, and they will not wonder that the end of the first day's run saw no less than 12 of the 35 cars with black marks against them. Some of these were from trivial causes, such as the 16 points chalked up against the Matheson, whose driver had to resort to a piece of string to prevent the sprag from dragging, though losing some 235 points owing to trouble with a radius rod. A trifling brake adjustment cost the Locomobile 10 points. No. 13 was an ill-omen for the Maxwell, as it lost 334 points through motor troubles, though it made all controls on time. The No. 2 Pierce four-cylinder car lost 51 points.

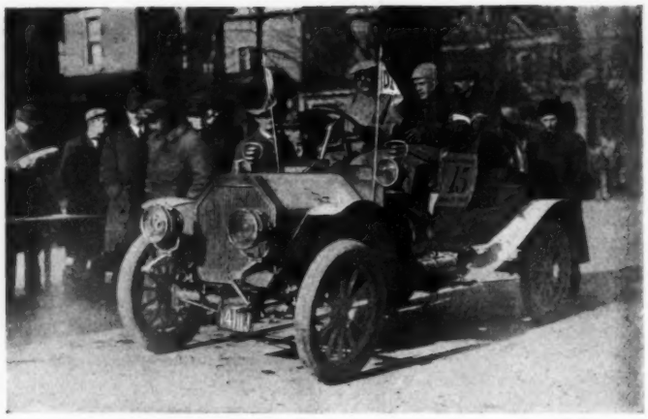
How They Ran the Second Day.

The second installment was to Rockford and return, a distance of 189 miles. Taken all in all, the roads were an improvement over those of the first day, and there were stretches where even the most conservative would have found it hard to resist the temptation to "let her out." The Autocar, driven by Barney Oldfield, suffered to the extent of 56 points; the Premier gath-



ALL THREE MEMBERS OF THE WHITE FAMILY FINISHED IN GOOD CONDITION.

ALL THE LIGHT-WEIGHT PASSENGERS WERE NOT WITH JACKSON.



JOHN HAYNES HANDLED THE LITTLE DRAGON RUNABOUT.

ered 35 points; the National got 4; the Studebaker the same number; the Rapid 'bus, the performance of which was one of the marvels of the run, added 29 to its initial gathering of 75 on the first day, but it brought its load of twelve passengers into every control, and the way it burned up the road with its load of rooters was the delight of the many farmers who lined the roads.

The four points placed against the Studebaker resulted from the driver's placing a chip of wood on the exhaust to hold the muffler cut-out open, which he did on the assurance of the observer that this did not constitute the use of tools and was accordingly permissible. E. Q. Cordner, the local Studebaker representative, filed a protest against the committee's penalization.

Penalizations on the Last Running Day.

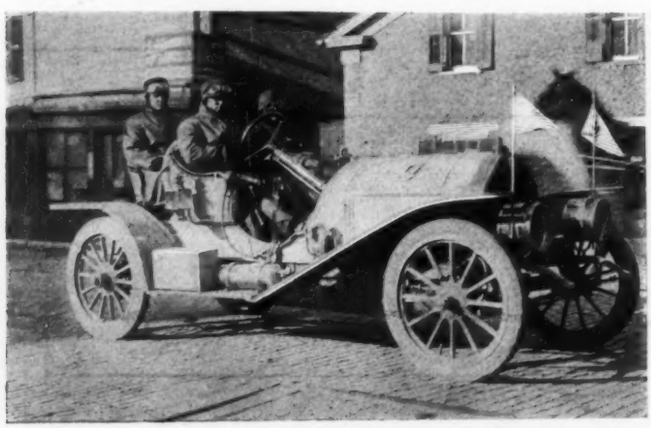
It was generally considered that many of those who had survived the grueling of the first two days' runs with credit would fall under the ban through minor causes on the last tryout, though the number which succumbed was not nearly as large as many had anticipated. The No. 2 Pierce-Arrow four-cylinder car, driven by Paul Hoffman, got through without adding to its initial 51 points lost on the first day, but the No. 6 Matheson fared badly, as it was necessary to break the bonnet seals at the early morning getaway in order to start the motor by pouring warm water on the carbureter, thus utterly ruining an otherwise perfect record, which would doubtless have been maintained to the end. It was assessed 401 points. The Wayne roadster was another to hopelessly damage its otherwise perfect record by colliding with the Maxwell, thus breaking its right steering knuckle and incurring a penalty. The Jackson touring car was penalized 50 points; the Autocar roadster gathered 2 points more, while the Maxwell, which traveled in hard luck all the way through, but pluckily stuck out the 600 miles, raked in no less than 610 points. The Rapid 'bus could not escape an additional 66 demerits, but if its total loss of points for the three days had been five times as great it could not possibly detract from the excellent performance of this machine. The No. 26 Matheson roadster and the No. 27 Stoddard-Dayton six-cylinder car did not start on the last day, while the No. 25 Reo runabout, which had only 38 points, gathered on the second day, against it, was put down in the committee's black book for having improvised a third seat by nailing a chair seat and back on the footboard in order to provide for a third passenger.

DETAILS OF THE PENALIZATIONS.

While many of the penalizations in the final summing up seem to be carrying things to an absurd extreme in the effort to eliminate possible winners, it must be added to the committee's credit that it carried a most thankless job through in a most conscientious manner. Herewith is the final official score of the event:

No. 14. Haynes—Perfect score. Official weight, 2,690 pounds.
No. 29. Pierce—Points lost: grease cup loose, 2 points. Official weight, 4,020 pounds.
No. 30. Oldsmobile—Points lost: emergency brake, medium, 2 points; driving shaft boot loose, 4 points; total, 6 points. Official weight, 2,790 pounds.
No. 3. Rambler—Points lost: pedal brake, medium, 2 points; lamp damaged, 4 points; speedometer loose, 2 points; total, 8 points. Official weight, 2,875 pounds.
No. 18. Auburn—Points lost: wheels and spindles out, 10 points.
No. 23. White—Points lost: running board loose, 6 points; apron loose, 6 points; total, 12 points. Official weight, 3,510 pounds.
No. 33. Locomobile—Points lost: fan belt off, 2 points; emergency brake, medium, 2 points; grease cup loose, 6 points; fender loose, 2 points; speedometer loose, 2 points; total, 14 points. Official weight, 3,710 pounds.

(*Continued on page 867.*)



IT WAS COLD TRAVELING ON THE SPEEDY STODDARD-DAYTON.

SEEING ILLINOIS ON A "RAPID" WAS AN EXPERIENCE.

NOTED IN THE MERGING OF THE TWO SHOWS

By CHAS. E. DURYEA, of the American Motor Car Manufacturers' Association.

CHICAGO, Dec. 3.—Chicago is a city of ample elbow room, and Chicago's elbows are busily employed, with the result that even an auto show covers lots of space and presents a wide variety. Here both the licensed makers and the independents, together with a goodly number of outsiders, show in harmony, making it the most representative single show of the year, and of such mammoth proportions that three buildings are filled to overflowing. Magnificent decorations and the separation of the commercial vehicles from the pleasure cars, both add to the harmony, beauty, and practicability of the exhibition.

Chicago, the scene of the first automobile event in America, twelve years ago, has ever been to the front in this line, and the Chicago shows have been interesting because of the variety of vehicles exhibited. This year is no exception, and the motor buggy, shown at Chicago for several years, is rapidly becoming an accepted factor, and Holsman, formerly laughed at by the makers of more conventional products, is now admitted to have shown good judgment and has quite a numerous following.

The two-cycle motor, also a product of the West, having been shown by Mitchell and Pierce several years ago, is now exhibited at this show by a maker from the extreme East, on the Atlas cars, as well as by others.

The friction-drive, another Western product, first shown at Chicago, is now largely in evidence on a goodly number of vehicles, particularly on a large proportion of the commercial vehicles; being shown on the Lambert cars, both for pleasure and business, where it has for years past proven its value, because of which fact it can no longer be regarded as an experiment, and purchasers need have no fear as to its practicability when properly made.

Standardization Still of the Future.

We often hear remarks to the effect that the automobile business is becoming standardized, but a study of the exhibits at Chicago shows very clearly that this is not the case; that, on the other hand, the exhibits diversify much more than they did two or three years ago, when the five-passenger touring car was the accepted standard. So long as individual tastes vary we will find an increasing diversity in motor vehicles permitted by the various possibilities in engine kinds and sizes, as well as by the widely varying seating capacities required by different purchasers, and the Chicago show exhibits this wide variety much more fully than did the Palace show at New York. There will always be some people wanting single-cylinder motors, like the Reo and Cadillac, although others prefer four-cylinder vehicles at practically the same price, like the Ford, while still others prefer six and even eight cylinders, not to mention steamers and electrics.

Another potent reason for diversity is the differing needs of the purchaser, who for city and social use buys the enclosed limousine of moderate power and of luxurious finish and appointment. But for touring, purchases the conventional touring car, low hung, with long base and ample power and particularly chooses for flexibility and easy riding, machine specially built with this end in view. While for city use and ordinary everyday service he buys a little runabout or one of the medium powered touring cars, or if he is a busy doctor, possibly a motor buggy.

Road Clearance Receives Consideration.

Other things also influence his decision, such as the roads over which the vehicle is to be used, so that where a few years ago 28 and 30-inch wheels were the rule, to-day there are examples of 38-inch, as in the Gaeth, and 36-inch wheels are quite common, particularly on the high-speed machines. Road clearance is now given more consideration; the low clearance of the average foreign machine having been found unsuitable for American roads, and therefore having given way to a more compact design which raises the mechanism without raising the body, with the result that, although having more clearance, the bodies are lower hung and the passengers are carried in a safer and more comfortable position than in former years.

In the mechanism itself greater diversity exists than in former years, and almost every detail may be seen at this show in many modifications. Transmission gears are found combined with the engine near the front of the vehicles, in a separate case at a midway position or combined with the balance gear on the rear axle, while vague promises of cars without transmissions occasionally are heard. The once almost universal cone clutch has been largely replaced by the multiple disk, but expanding and contracting bands are seen in many instances, and the use of the band for braking purposes would indicate that it is amply able to serve as a clutch, and that we may expect a much greater number of band clutches than we have had in the past.

Position of Throttle and Spark Lever.

Even in features directly connected with the control of the car, such as the position of the throttle and spark levers or the arrangement of the foot pedals, there is a considerable diversity; the spark control being sometimes under the foot and at other times inside or outside of the wheel, sometimes on the left, again on the right, and in still other vehicles at the bottom or at the top. In a few instances the controlling lever is not stationary on the wheel column, but moves with the wheel, from which it will be seen that even in so simple a feature as the position of the throttle or spark lever there are nearly a dozen different arrangements. Yet it would seem reasonable that in the controlling equipment a standard practice should be followed, so that users might find themselves at home on any type of car, instead of having to accustom themselves to each controlling group.

The reason this is not done lies in the different needs of the purchasers, as seen by the makers who prefer to arrange their vehicles in the simplest and handiest manner which they believe will be most satisfactory and least tiresome to their users, rather than adopt the arrangement employed on some other vehicle which they consider less satisfactory.

Diversity Extends to Minor Parts.

This diversity extends also to the minor parts, such as the cooling fans. Here it would seem reasonable that the ordinary four-bladed fan developed by years of use as the most efficient device for throwing air in connection with the small economical motors, found in nearly every office in hot weather, would be employed almost generally; but such is not the case. Instead there is a wide range in the number of fan blades, reaching a dozen in number in one or two instances and varying also in shape, from a straight, narrow spoke-like blade to ovoid and fancy designs. Some of these fans are housed to direct the air in its intended path; others are in the open, and depend upon the shape of the blade to accomplish this purpose.

It would seem that in details of this kind, where the purchaser is interested only in results, that it could be determined by experiment which fan is most efficient for a given size and power, and that this most efficient form should become universally used.

For years users have hoped that tires would become standardized, but with greater diversity in wheel sizes and the adoption of quick detachable rims by many makers without the abandonment of the older forms, there seems to be no promise that this result will come about.

It is quite evident from this show that in the near future a separation must take place and different classes of vehicles will be exhibited in separate buildings, possibly at separate times, and that diversification is bound to increase.

ON THE OPEN ROAD WITH THE GEARLESS GREYHOUND SIX-CYLINDER AS A THROTTLED COMPLACENT REARGUARD.

HOW A SIX-CYLINDER AUTO HELPED A VETERAN WALKER

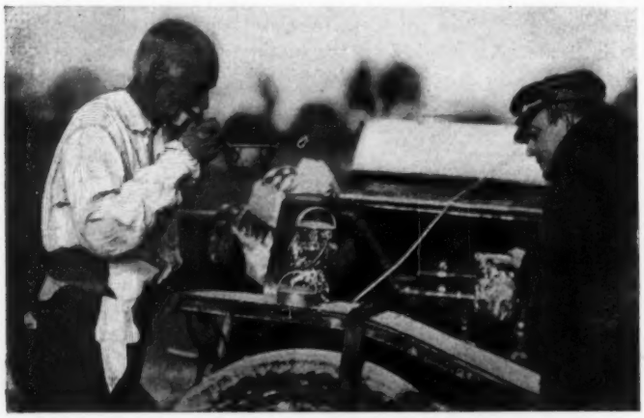
CHICAGO, Nov. 30.—Seven hundred and thirty-five miles on the low gear at the rate of three to four miles an hour, over roads that defy description, is a feat no less marvelous for an automobile than that of the 1,200-mile walk of Weston, the pedestrian, whose performance was the occasion for it. John W. Breyfogle, vice-president of the Gearless Transmission Company, Rochester, N. Y., and George D. Wilcox, its manager, in a spirit of athletic good-fellowship, decided that helping the veteran pedestrian on his trip to Chicago would constitute a test for a car such as had never before been undertaken. There are records and records of every imaginable nature, but the palm for making a slow pace, hour after hour, often for twenty hours out of the twenty-four, without heating or trouble of any nature, must certainly be handed to the Gearless Greyhound, and some idea of what the performance of this 75-horsepower six-cylinder car means may be gained from the fact that few, if any, of the drivers of low-powered cars who turned out by the score to join the procession at different towns along the way found it possible to maintain the slow pace for more than a few miles at a time. Not an involuntary stop was made, the only replacement being a burst tire, which was run flat till Weston halted.

Equipped with two 12-inch Rushmore searchlights—the largest automobile headlights to be had—and a unique buffet kitchen improvised over the exhaust manifold of the motor, Manager Wilcox and Mr. Breyfogle joined Weston at Rochester, November 12, leaving there shortly after noon. Both were familiar with the route and road conditions along the way through having driven over it previously. The pair took turns at the wheel, and as Weston did far more walking than sleeping, one of them found it convenient to bunk out on the fender of the car.

When seen at the Illinois Athletic Club, Weston simply bubbled over with enthusiasm regarding the aid which the automobile had rendered him. "Made it possible to cut off at least ten hours from the record," he said, "and saved fully half the fatigue of stumbling into the ruts and mudholes, the lamps making it as light as day. But the old man, in his ignorance of things automobile, made it doubly hard for the sleepy driver of the car at night, as he would drop back without warning from his place, ten or fifteen feet in advance of the car, to warm his hands on the radiator, or to place on the car one of the endless gifts that enthusiastic admirers along the way handed out. Even at that slow speed, to have struck him would doubtless have ended the walk, so that the strain on the driver may be imagined. And how long-drawn-out a process this was may be gleaned from the fact that toward the last Weston walked almost continuously, one of his stretches being from Sunday morning at 12:08 (midnight) to Tuesday afternoon at 4:10, during which time he only stopped fifty minutes all told, covering ninety-five miles.

But neither the light nor the protection the automobile afafforded was superior to the service it rendered as traveling kitchen of the "Johnny-on-the-spot" kind. Weston carried a whistle constantly and a blast on it was the signal for the driver-chef to get busy. The man off duty would put the cans of coffee, milk, or soup on the "gas stove," or even get ready to "boil two medium"; the driver would speed up a bit and the kitchen would be in full blast.

To protect Weston from the crowds which fairly mobbed him, Wilcox attached two 50-foot pieces of stout rope to the forward dumb irons, and when a town was entered the ends of these would be handed out to the most prominent of the local authorities that could be corralled. With the aid of this improvised *cordon* Weston could proceed undisturbed.



LAST CALL FOR SUPPER ON THE "DINING CAR."

MAYOR BUSSE ESCORTING THE HERO AT THE FINISH.

LEARNED IN THE PROCESS OF EVOLUTION*

By CHARLES B. HAYWARD.

DOCTORS' mistakes are said to be put under six feet of ground; lawyers' errors often hang, while those of the cloth are said to arrive at the wrong destination. But who pays for the automobile designers' slips? The buyer of the car naturally has to foot the bills every time, or, as it is expressively put in the vernacular, "the dear public pays the freight." It may seem unfortunate that, over and above the first cost of a car, its purchaser should have to pay for fundamental errors of design or poor judgment in the choice of materials, but experience in whatever line has to be bought dearly, and had it not been for the lessons learned from a great number of cars it is quite probable that the development of the automobile would not have advanced at the extremely rapid rate that it has. A rope that is almost severed will frequently stand an amazing load, and a poorly built car of cheap materials will often give satisfactory service, as is borne out by the sententious observation of the New

FIG. 1.—Typical instance of defective design, insufficient material in the cheek.

York agent of what was probably as cheaply put together a machine as has ever been marketed in quantities. "Some of our customers never have any trouble, but a great many of them can't go ten miles without having something break." A statement illustrative of the chance destiny that causes some to succeed while others fail, though all be cast in the same mold.

Some Parts that Break Oftenest.

It also seems particularly unfortunate, at least from the viewpoint of the owner of the car, and who is in consequence paying for the designer's experience, that expensive parts should have such a habit of giving way. For instance, crankshafts are among the commonest and at the same time the most costly parts of the car to replace. In the course of little more than one month 26 instances of broken crankshafts were reported on one of the best-known foreign cars that is imported into this country. That is, this number were brought to the local agency for repairs, some of them being illustrated by photographs in connection with this article, but of them more later. Right here a momentary digression may be made to remark that it is not the cheap car that is always giving way by any means. Of all the cars with which the present deals, whether directly or indirectly, more than 90 per cent. of the broken parts were from some of the highest-priced cars made on either side of the Atlantic—cars in which it is to be presumed, judging from their selling price, if nothing else, that no pains or expense had been spared to make their design and construction as advanced an example of the automobile builders' art as it was possible to produce.

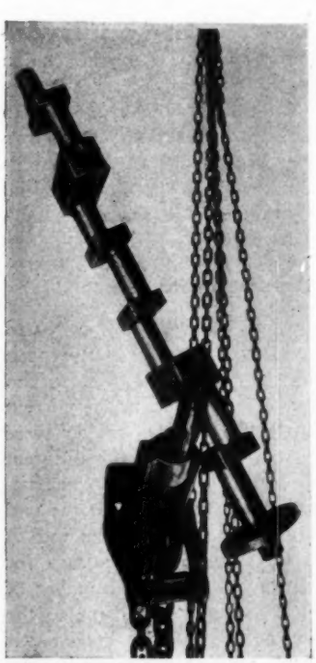


FIG. 2.—Somewhat of a freak design, this crankshaft being designed for a motor no larger than that of Fig. 1.

Front axles, frames and springs are other equally expensive parts that have a habit of giving way when least expected, and of these three probably the last-named is the most common. As a matter of fact, the frequency with which springs give way shows conclusively that there is a great deal of room for better-

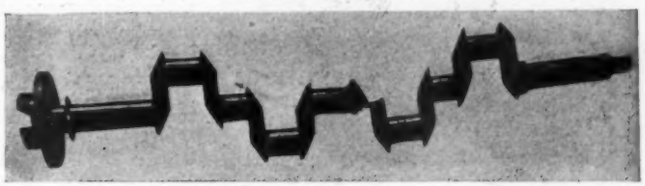


FIG. 3.—This is a repetition of the same fault as that characterizing Fig. 1, and occurred on the same make of car.

ment in this essential, and this is one of the things in which choice of poor material is most often found to be at the root of the trouble, though incorrect design plays its part here as elsewhere. For instance, it avails little to supply the best spring that money and skill can create, if it is to be held on its saddle by U bolts of common wrought iron or Bessemer steel from the hardware dealers' stock. Under such conditions the spring does not remain rigidly attached to the axle for any great length of time, as the strain soon causes a permanent set in the bolts, frequently amounting to 1-16 inch or more, permitting the spring to crawl. Then, instead of absorbing the shock through its leaves, as would be the case were it rigidly clamped down, the whole spring is lifted and thrown bodily against its support, before this dampening action can begin, and the result is a break. In consequence it is found that the springs usually give way under the clamps. Steel comparatively high in carbon usually

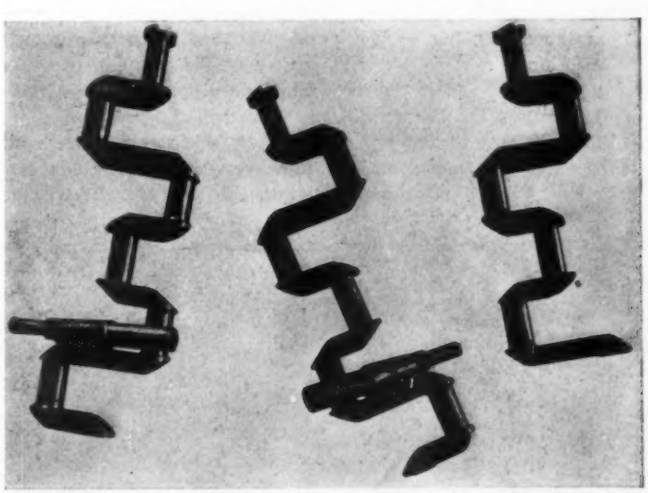


FIG. 4.—Three from a batch of more than a score, all of which broke in the same place in little more than a month.

about 60 point, is the material most commonly employed for this purpose and serves its ends satisfactorily—more so since the requirements have come to be better understood. It has been found that the semi-elliptic spring is exceedingly sensitive and on that account particularly desirable where roads are good, as is the case abroad, but its limited range of action does not fit it for extreme shocks, and the full elliptic type is much more favored on American cars, those designers who retain the former making it very much longer than was formerly thought necessary.

* Photographs by the author.

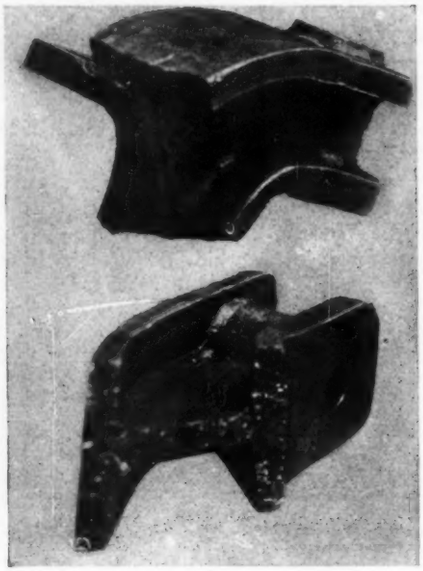


FIG. 5.—Extreme instance of crystalline structure in aluminum alloy

To the experienced eye every broken crankshaft tells its own story, and when this important essential breaks faster than the agent can make replacements, and all the breaks are in the same place, it would not appear as if the significance of the wholesale defection were very deeply hidden. This is the case already referred to, in which at least 26 owners who had paid for high-priced foreign cars found occasion to go to the expense of replacing the crankshafts in the course of a month. There may have been more, but certainly the number cited was enough to point the moral, and the group of three shown by the accompanying photograph, Fig. 4, speaks for itself. As will be noted from this, all have given way at exactly the same point, two of the ends being shown, while the third is missing. From the designer's point of view this was the "right place" for those crankshafts to break, if there can be said to be such a thing. In other words, it sufficed to show conclusively that not the design but the material was at fault. This is made clear by reference to Figs. 1 and 3, taken from an American car—a high-priced one at that—which are typical examples of defective design, an insufficient amount of metal being allowed in the cheek where it joined the crank pin. But examination also proved the material to be defective, being too high in phosphorus, and consequently what is termed "cold short," tending to brittleness. In this connection it may be mentioned that carbon steel possesses the peculiar property of splitting or running when notched or nicked, and this quality has caused trouble with crankshafts drilled for oil holes.

But to return to the group of broken shafts—these were all taken from one model of the same car—one of the highest-priced machines that is imported into this country. It will be noted that the rupture invariably occurred at the point of maximum load, between the flywheel and the fourth crankpin, a point where the summation of all the stresses is centered. The breaks were due to flexure of the material, which was not sufficiently rigid to stand the constant bending strain without giving way—a fault that seriously affects the dynamic life of the part with the result so strikingly depicted by the photograph—and it may be added, so painful to the owner of the car. The crankshaft illustrated by Fig. 2 is merely shown as an instance of what extremes designs may sometimes be carried to. In the first place, this crankshaft has sufficient metal in it to transmit several times the power of the engine for which it was intended. The designer's idea in giving it this shape was to evolve a three-bearing crankshaft which could be easily machined in a lathe, the space ordinarily occupied by giving the intermediate connecting cheeks a staggered relation, being filled by large blocks which were drilled to reduce the weight. But it will be noted, by referring to cut, that in drilling these a far thinner web has been left than is employed in the other cheeks, which would seem to indicate that the others were unnecessary, which, in fact, is the most striking characteristic of the whole piece, as it is not intended for use in any larger motor than the other shafts shown on this page, the pictures all being in the same proportion. While, so far as known, it has not occasioned any unusual trouble, it would appear to constitute a good example of how not to make a crankshaft. Before leaving the subject of crankshafts, it may be stated on the authority of a designer who has probably had a better opportunity to find out the weaknesses of a great many cars than often falls to the lots of his confrères that some cheap American engines of several years ago actually had *cast iron* crankshafts and that he never saw a broken one—a fact that illustrates the point that where the metal has sufficient initial rigidity and is free from internal strains it will serve this purpose as long as its rigidity is not disturbed.

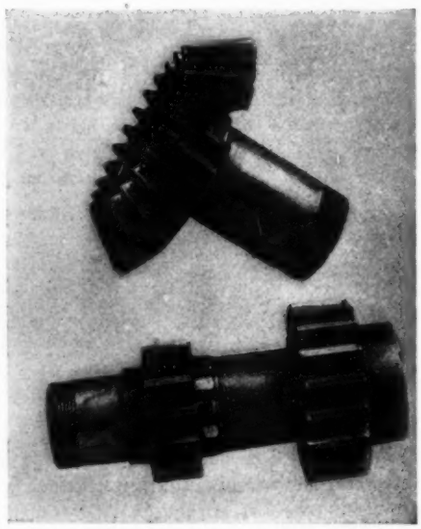


FIG. 7.—First, an instance of high-priced material of the wrong kind; second, the result of abuse of the best of materials.

FIG. 6.—Four expensive breaks, all on cars of the same high-priced make and all due to the same cause—improper material.

Frames and Front Axles Frequently Go.

Doubtless the average observer would ask what the driver of the car happened to collide with to cause the four petty specimens of frame breakage shown by the photograph, Fig. 6, and would be correspondingly surprised to learn that, in the current slang of the day, these frames simply "laid down." They were not in a wreck or collision of any kind. All are from different cars, but of the same make and of high-priced French construction. They gave way simply because they had come to the end of their life—all are flexure breaks. The point of bending of the material was fixed at a point far below that necessary for such requirements, and having withstood the limited number of shocks of which it was capable of resisting it had come to the end of its dynamic life. The usual point of frame breakage is the rear end of the front spring, and it shows the fallacy of reducing the section of the side frame member excessively, though binding of the hanger is sometimes responsible. As a matter of

fact, however, the frame seldom defaults except in cases of extreme stress, such as could not be adequately provided for by any reasonable design—in short, wrecks and collisions.

Front, axles, however, are in quite a different class—in fact, they form a rather close second to crankshafts, one European car that bears an excellent reputation having a record of sixteen failures in this essential during a comparatively short time. It was not merely a case of poor metal, but a poor distribution of the metal at a load-carrying point—between the spring hanger and the steering knuckle, another equally prominent foreign car having suffered similarly in spite of the fact that the material was all that it should have been. The story is really one of wheels within wheels, for the design of the latter was faithfully copied by that of the former before its originator had had any experience in its use, but the copy was a Chinese imitation in that extremely poor material was employed to execute it. As already mentioned, front axle breakage is most common between the spring saddle and the steering knuckle, and in the attempt to save weight excessive reduction of the section of the axle had been made at that point. On later models of the first-mentioned car it was noticeable that the reduction or I-beam section at the point in question was scarcely more than a surface indentation and was presumably for appearance sake only, as the amount of weight thus saved would be practically a negligible quantity.

Minor Parts that Wear and Break.

It may occasion the experienced autoist no little surprise to note that as yet nothing has been said of the shortcomings of the gearbox. The truth of the matter is, so much attention has been given to this essential that it has reached a point where, in the words of a well-known designer, "it is above suspicion." From being the most prolific source of expense where mechanical replacements are concerned, it has attained to the other extreme. Proper materials, better designed teeth, accurate cutting and the use of ball or roller bearings sum up the improvements; where it was nothing unusual to ruin a gear-set a season, with legitimate use there is now no reason why the life of this part of the car should not correspond with that of the vehicle as a whole. But that improper handling will do damage, despite the designer's best efforts, is well illustrated by the sliding member taken from an expensive French car and shown in the lower half of Fig. 7. Neither the material nor the design left anything to be desired—they could hardly be improved upon, and ordinarily the badly worn pinion on the left should have lasted the life of the car. As it is, it forms a striking example of the long service obtainable from proper design and materials under the most adverse conditions. This, in short, is purely a case of poor driver. The man who handled the lever on the car in question was in too much of a hurry to get under way and had a habit of letting the clutch re-engage before the pinions were fully meshed. In this way the entire load was carried by the corners of the gears, and that they were able to do this on slightly less than a third of the tooth surface allowed by the design, as shown by the worn portion, bears witness to the ample factor of safety allowed.

FIG. 8.—Illustrating the fact that no part of the car is immune.

It is doubtless the average layman's opinion that poor material is synonymous with low first cost and that if the maker cared to share his portion of the burden of expense there need be no further ground for complaint on this score. The bevel pinion shown in the upper half of the same illustration, Fig. 7, is evidence of the fact that this is not always the case. It was taken from a French car that is built in this country under license and is an excellent illustration of misplaced high-priced material. Analysis showed it to be of 13-point Tungsten steel, a nature-hard steel, oil quenched, that was the prize tool stock of several years ago. The pinion in question was replaced with a low carbon steel wheel, and it is safe to say that, barring accident, the new bevel will last as long as anything else on the car will. Steel of this kind has better dynamic properties and will simply wear out in use, whereas the Tungsten steel is practically non-dynamic and wholly unfitted to withstand shock. Neither the bevel driving unit nor the differential occasion much trouble, owing to the fact that there are so many intermediate steps between them and the source of power that shocks do not reach them directly. This also accounts for the immunity of the cardan shaft, as breakages here are also more or less rare.

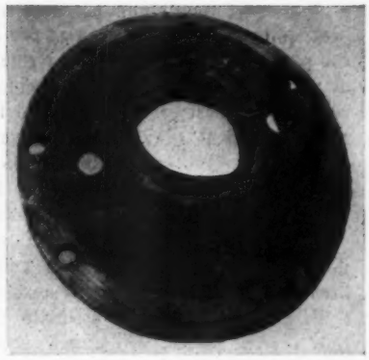


FIG. 9.—Typical case of extreme bungling in an alleged light racing car.

The Maker Paid for This Experience.

It has already been said that the gear-box is no longer a great source of expense in the way of replacements to the autoist, but this had reference more particularly to the contents rather than to the gear-box itself. Aluminum alloys have always been a source of more or less trouble, but "not when they are properly alloyed and cast" immediately retorts the aluminum founder. There's the rub—not every automobile manufacturer makes his own aluminum castings, and not every maker is fortunate in always getting a supply that conforms to the requirements. One year—it was in the transition period of 1903, by the way—the makers of one of the highest-priced foreign cars found it necessary to call in all the gear boxes that had been sent out on cars of that year's model when the season was well advanced and a large number had been turned out. This was a case in which the error was of so serious a nature that the maker preferred to stand the expense of replacement himself rather than saddle it on the purchaser of the car. A little consideration would seem to indicate that the wholesale breaking of crankshafts chronicled earlier fell within the same category, but unfortunately this was not the case. It seems rather a coincidence that both these costly errors of design should have occurred on the same make of car.

Another instance in which the maker had to foot the bill—in this case unwillingly—is recorded by the illustration of the two broken crankcase arms, Fig. 5. These were taken from a car of French make and of

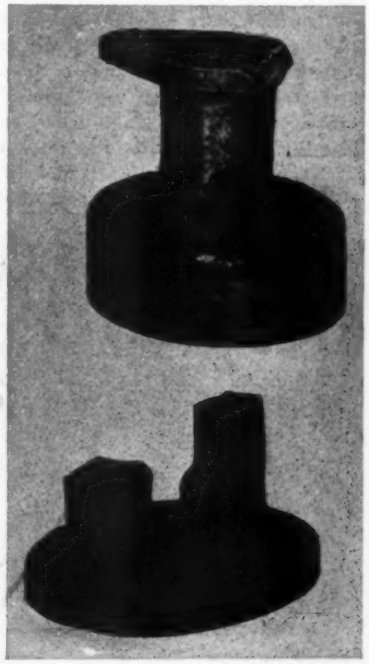
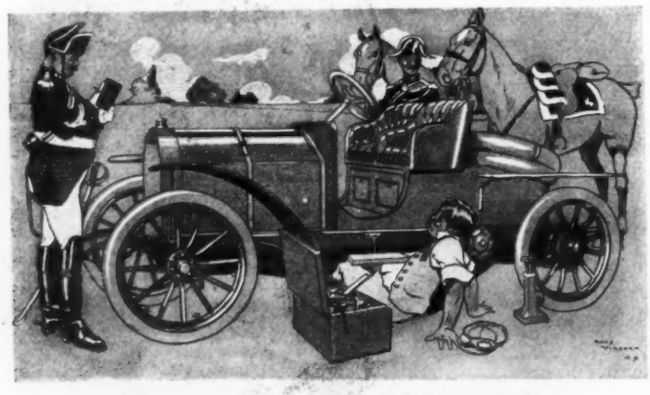


FIG. 10.—The first of these pieces was not at fault, but the second shows the result of very poor design.

such sterling reputation that numberless American autoists have been quite willing to pay the 45 per cent. duty in order to become the possessor of one. It is not referred to here to its detriment, as it was merely one of those accidents that are apt to happen at times in the best of well-regulated families and on the best built cars, regardless of where they are made. Usually such faults make themselves known before the car leaves the factory, but this was an exception. The New Yorker who purchased it refused to settle for the car and was sued by the maker's representatives. The former enlisted the services of a well-known designer as an expert witness and, divining the cause of the break at a glance, the expert casually picked up a hammer and dealt the offending case a smart blow. The part struck broke into several pieces, which flew about the room, and the result was such a surprise to the intending litigants that the action was never pressed any further. Both the arms shown are from the same crankcase, the one at the right being the part that originally offended, while the other was broken intentionally to examine the nature of the fracture. The crystalline nature of the break in the first is strikingly evident even in the photograph and shows plainly that the metal was burnt. Of eight or ten cases of similar breaks this was by far the worst, but, as already mentioned, was nothing more nor less than an exceptional instance. Aluminum properly alloyed to meet the requirements of this service will pene down under the hammer.

Some Unusual Instances of Breakage.

If a designer were asked what, in his opinion, constituted a part of the car least apt to break, he could probably think of nothing that would answer the question better than the starting crank. Yet starting cranks do give way, as evidenced by the substantial specimen pictured in Fig. 8. It only goes to show that some men, when at the end of the crank, are well able to stand the shock of a backfire, and this is not always true of the crank itself. Fig. 9 represents what was originally a differential housing and is an excellent example of what should not be done. It was taken from a specially built racing car and strikingly exemplified the amateur idea of weight saving. The pinions were made microscopical in size, while the cast steel casing would have held down an ocean liner, if properly applied. It is merely a case of a vast surplusage of material coupled with bad design in other respects. The piece shown in the upper half of Fig. 10 represents a differential sprocket housing from a heavy side-chain driven car, but scarcely calls for extended comment, as the result shown was more of an accident than otherwise, both the material and design being good. Beneath it is illustrated an error in design, pure and simple. In this the jaw clutch of the direct drive of a gear-set was made with but two projections, so that when engaging the parts had up to 90 degrees travel before striking with the excessive wear shown as a result.



ANOTHER CASE FOR THE COURT TO ADJUDICATE.

French Gendarme—"Having asked him what he was doing there hidden under the car, he replied that he was hunting a cotterpin; consequently we have drawn up a summons for illegally hunting an unknown game during closed season."—*Omnia.*

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Nov. 30-Dec. 7..—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show, and First Annual Commercial Vehicle Show, National Association of Automobile Manufacturers.
Dec. 9-14.....—Detroit, Riverview Park Auditorium, Detroit Automobile Dealers' Association. LeRoy Pelletier, manager.
Dec. 14-21.....—St. Louis, Mo., Jai Alai Building, Second Annual Auto Show, St. Louis Automobile Manufacturers' and Dealers' Association. D. M. Strauss, manager.
Dec. 28-Jan. 4..—New York City, Madison Square Garden, Importers' Salon. C. R. Mabley, manager.
Jan. 14-18.....—Hartford, Conn., Foot Guard Hall, Hartford Automobile Dealers' Association.
Feb. 1-8.....—Providence, State Armory, Automobile Show. Frank M. Prescott, manager.
Feb. 10-15.....—Detroit, Light Guard Armory, Tri-State Automobile and Sporting Goods Association, Seventh Annual Show.
Feb. 17-22.....—Cleveland, Central Armory, Annual Show, Cleveland Automobile Dealers' Association. George Collister, manager.
Mar. 7-14.....—Boston, Mechanics' Building and Horticultural Hall, Boston Automobile Dealers' Association. Chester I. Campbell, manager, 5 Park Square.
Mar. 9-14.....—Buffalo, Convention Hall, Sixth Annual Automobile Show, Automobile Club of Buffalo. Dai H. Lewis, manager.
Mar. 21-28.....—Toronto, Canada, St. Lawrence Arena, Automobile Show. R. M. Jaffray, manager.
Apr. 5-12.....—Montreal, Canada, Arena, Third Annual Automobile and Sportsman's Show. R. M. Jaffray, Mgr.

Motor Boat Shows.

Dec. 7-14.....—New York City, Grand Central Palace, National Association of Engine and Boat Manufacturers. Chester I. Campbell, manager, 5 Park Square, Boston.
Jan. 1-8.....—Chicago, Coliseum, National Association of Engine and Boat Manufacturers. Chester I. Campbell, manager, 5 Park Square, Boston.
Jan. 25-Feb. 1..—Boston, Mechanics' Building, National Association of Engine and Boat Manufacturers. Chester I. Campbell, manager, 5 Park Square, Boston.
Feb. 3-8.....—Buffalo, Convention Hall, First Annual Power Boat and Sportsman's Show, auspices of Buffalo Launch Club. Dai H. Lewis, manager.
Feb. 20-Mar. 7..—New York City, Madison Square Garden, Fourteenth Annual Motor Boat and Sportsman's Show.

FOREIGN.

Shows.

Dec. 5-22.....—Berlin, Germany, Automobie Show.
Dec. 21-Jan. 2..—Brussels, Show, Palace of the Cinquantenaire.
Jan.18-Feb.2,'08—Turin, Italy, Fifth International Automobile Exhibition, Palace of Fine Arts, Valentino Park, Automobile Club of Turin.
Mar. 21-28.....—London, Agricultural Hall, Cordingley's Show.
May 6-20.....—Moscow, Russia, International Automobile Exposition. Automobile Club of Moscow.

Races, Hill-Climbs, Etc.

Dec. 8.....—Paris, Straightaway Aeroplane Speed Test, auspices of "L'Auto."
Dec. 8.....—Paris, Break-down Competition, auspices of "L'Auto."
May, 1908.....—Paris, Competition for Agricultural Automobiles, auspices of "L'Auto." (Exact date to be announced.)
May 10.....—Sicily, Targa Florio, Automobile Club of Italy.
June 20-July 5..—Grand Prix, Dieppe Circuit, Automobile Club of France. (Exact date to be announced.)
July 13-17.....—Ostend, Belgium, International Race Week, Automobile Club of Ostend.
July 20-30.....—Ardennes Circuit Races and Coupe de Liedederke, Automobile Club of Belgium.
August, 1908...—France, Coupe de la Presse, Automobile Club of France. (Exact date to be announced.)

LETTERS INTERESTING AND INSTRUCTIVE

IS FRONT FLYWHEEL PLACING WRONG?

Editor THE AUTOMOBILE:

[991.]—Will you kindly inform me through your "Letters Interesting and Instructive" if there is any mechanical or scientific objection to placing the flywheel of an automobile engine in front, as in marine engines, instead of back of the engine as is done in the majority? I have been told that it is mechanically incorrect and that in engines so constructed there is a greater strain in the shaft when the clutch is let in and that the main bearings are shorter lived. Please go into the matter as thoroughly as possible, as I am anxious to form an opinion one way or the other.

St. Louis, Mo. ALBERT C. HAUSMAN.

Without going into the matter deeply from a theoretical point of view, it is evident that the location of the weight of the flywheel on the forward end of the crankshaft will impose an extra torsional strain on the crankshaft when the clutch is let in, and this should be particularly noticeable where the engagement is sudden or harsh. With the flywheel at the rear, as ordinarily employed, it will be apparent that the shock of starting is absorbed by the momentum of the wheel before reaching the crankshaft, whereas in the other case it must necessarily be transmitted through the crankshaft before reaching the wheel. However, whether this is really sufficient to make the main bearings appreciably shorter lived, or whether it can be said to constitute a form of practice that is mechanically incorrect, is quite another thing, for the practice of placing the flywheel at the rear end was more the result of accident than otherwise. The cone clutch was then universally employed and it was found most convenient to combine it with the flywheel, though this situation also gives a better distribution of the weight. The Stevens-Duryea, Northern and Maxwell cars are some instances of forward placing of the flywheel that have been consistently adhered to in this country, while in the Motobloc, a French type, the flywheel is centrally located between the two pairs of cylinders. Probably some of our readers who have had personal experience with cars of both types—i. e., in which the flywheel has been at either end of the crankshaft—may throw some more definite light on the subject. Endless mathematical formulæ could be adduced in support of either position, but such evidence does not carry a great deal of weight with the average man.

WHY ARE VALVE STEMS NOT LUBRICATED?

Editor THE AUTOMOBILE:

[992.]—Will you kindly explain in your columns why it is that automobile manufacturers, without exception so far as my observation has gone, make no provision for the lubrication of valve stems in their motors. It has always seemed to me that it is of as much importance to have the valve stems lubricated as it is of any other part, the valves being a very important part of a motor.

Minneapolis, Minn. O. A. WEISS.

On the majority of modern motors the camshaft is located in the crankcase and is exposed to the splash of the oil utilized for lubricating the main bearings, pistons and other moving parts. This oil takes care of the lubrication of the camshaft bearings, cams, rollers and the like, as well as the valve push rods, the housings of which are usually open from below for this purpose. The movement of these rods seldom exceeds 3-8 inch. so that, despite their speed, they do not require a great deal in the way of lubrication. Many drivers find that an occasional drop or two of oil allowed to run down the stem is all that is necessary, while others seldom touch these parts of the motor, and we have known cars having overhead valve gear of the rocker arm type to run 600 miles without being oiled. We have known cases of seized valve stems on racers, which could be traced, however, to a breakdown of the lubrication system. The answer to your query would accordingly seem to be that there is no necessity for such provision, but if there are any of our readers whose experience indicates otherwise we should be glad to have their views.

WHAT POWER AND SPEED WILL THIS HAVE?

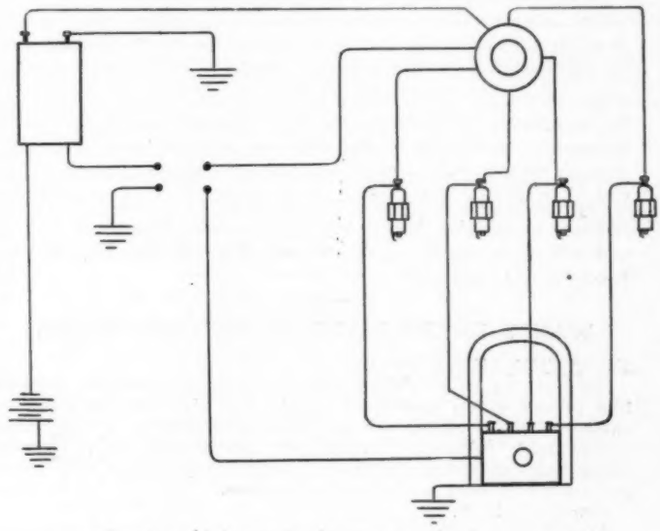
Editor THE AUTOMOBILE:

[993.]—I have just completed a four-cylinder motor as follows: cylinders, 6 x 6; exhaust valve, 3 3-8 inches with .3-inch opening, intake valve the same; exhaust valve has 1-4 inch; lift intake has 3-16 inch; lift valves are on opposite sides; compression, 78 pounds; connecting rods are 12 inches long; the motor is very flexible, and rather high speed. I am going to put it in a touring car and will gear it 2 1-4 to 1, using 36-inch wheels. Kindly state horsepower of same, also how fast motor should turn up, and how fast car should travel at its best.

I would also like some information on the following: I want to use a high-tension magneto with one set of plugs, also single coil, and distribute them as per sketch. I want to use the storage battery, single coil, and distribute for starting and after starting switch over to the magneto. The magneto will be a Bosch.

Baltimore, Md. EDWIN S. ZELL.

Why not give the exhaust valve the same amount of lift as the intake, as it is equally essential to clear the combustion chamber of burnt gases as it is to fill it with the fresh charge. Ac-



[SKETCH OF MR. BELL'S PROPOSED IGNITION SYSTEM.

cording to the A. L. A. M. horsepower formula, the output of the motor should be 57.6, but its actual brake output at 1,200 r.p.m. would probably be nearer 80 horsepower. You say it runs very fast, presumably light, and if you will ascertain this speed with a counter, taking two-thirds of it will give you the speed of maximum torque, this rule being found to apply to the great majority of motors similarly proportioned. As you have allowed liberal valve openings, doubtless the free speed of your motor will reach as high as 1,800 r.p.m., or a little over, so that its maximum torque would be reached in the neighborhood of 1,200 r.p.m., though it will probably run as high as 1,500 r.p.m. without showing an excessive falling off in power, and that this figure may be taken in calculating the probable speed of the car. The 36-inch wheels cover 9.91 feet per revolution, or for convenience in figuring, 10 feet. As the gear ratio is to be 2.25 to 1, neglecting any loss from slippage or similar causes, the road wheels will make 660 turns per minute, or about 1.25 miles per minute. The gear ratio is low for a motor of this power and by raising it a speed of ninety miles an hour or over would be obtainable—rather high for a "touring" car in either case.

Referring to your sketch of the proposed ignition system, we have altered this as indicated. As one end of the primary winding of the magneto is grounded on its frame, merely fastening it in place on the car gives the primary ground connection. By taking a wire from the other terminal of the primary

to a switch, one point of which is grounded as shown, the magneto may be cut out by short-circuiting its primary winding, this being the usual method. The secondary connections are taken directly from the distributor on the magneto to the plugs, as shown. One side of the battery is grounded and the other led to the single coil; the second terminal of the primary of the coil is led to the low-tension side of the distributor, a switch being interposed as indicated to permit of shutting off this side of the system. One of the secondary terminals of the coil is grounded and the other led to the distributor, the latter, of course, being grounded in the usual way, the connections not being indicated, in order not to complicate the diagram unnecessarily. Starting is so easily accomplished on the magneto and the latter is so reliable that we should hardly think it worth while to go to the trouble of installing the second system on a home-built car.

HOW DO RADIATORS DIFFER, AND WHY?

Editor THE AUTOMOBILE:

[994.]—Will you please inform me, through "Letters Interesting and Instructive," what the difference is between cellular and tubular radiators, and which is superior? J. E. HARRIS.

New York.

A cellular radiator is built up of a great number of small parts, in practically the same manner as a honeycomb radiator is made. These parts are small tubes, their length being that of the thickness of the radiator. They come together at both ends, where they are soldered, but are of smaller section for the remainder of their length, thus leaving thin water spaces between. The tubular radiator is composed of large, flat tubes, covered with radiating fins, and through which the water circulates. From the point of view of efficiency alone, the cellular radiator is superior, but owing to its construction, it is delicate and difficult to repair, so that the tubular type is ordinarily preferred in this country.

WANTS ENTRY LISTS OF FOREIGN RACES.

Editor THE AUTOMOBILE:

[995.]—Being an interested reader of "The Automobile," I would like to ask a few questions. Could you give me the complete entries of the following events: Scottish Reliability Trials, Targo Florio, Irish Reliability Trials, and the Bexhill Speed Trials? These being all foreign contests, I could not find them out, and if you could help me I would be much obliged. L. R. W.

New York, N. Y.

These events having attracted a large field of entries. it would be impossible to reproduce the full lists here, the matter being only one of personal interest. If you will give a more complete address than "New York," we will be pleased to give you the desired information by mail.

SOME INTERESTING QUERIES AS TO PRIORITY.

Editor THE AUTOMOBILE:

[996.]—As a reader of your interesting journal, I take the liberty to ask the following. Several makers claim that they built the first six-cylinder car. (1) What American company first marketed such a car (2) Where did the three-point support, as applied to automobiles, originate? What American concern first used the above construction? (3) What American maker first turned out cars having the power plant installed as a unit? (4) I am under the impression that the motor 'buses used in New York City are made in England. Please state what company built them. (5) Is the Darracq the only make of taxicab used in New York City?

Brooklyn, N. Y. C. N. S.

1.—We believe the Gasmobile Company, a concern that became defunct the latter part of 1902, should be credited with having offered the first six-cylinder car for sale. It was exhibited in the show in Madison Square Garden in January, 1902, and was generally regarded as nothing more or less than one of the many freaks that each succeeding show of that time brought forth. So far as we are aware, this was the original six-cylinder, but these columns are open to all claimants of the honor. Unless such claims do appear, antedating the foregoing conclusively, the old Gasmobile must be awarded the palm in this respect.

2.—We do not know to a certainty and will have to refer the question to our readers. Both the Stevens-Duryea and the Autocar embodied this form of construction in early models.

3.—This also applies to the unit power-plant, and necessarily so, as the idea is to give both the power-plant and the transmission the benefit of the three-point suspension, and to do this most conveniently they must be combined.

4.—The motor 'buses used in New York City are made in France by the house of De Dion, but the output of the latter has been contracted for by an English firm, which markets them and accordingly affixes its name plates to the chassis.

5.—There are a number of different makes of taxicabs running in New York City, but the Darracq (red) and the Delahaye (green) predominate. Some of the others are the Renault, De Dion, Aries and Chenard-Walker, all of French manufacture, but only having one or two representatives of each make, though all ply regularly for hire.

WHERE THE FOUR IS BETTER THAN THE SIX.

Editor THE AUTOMOBILE:

[997.]—In the October 31 issue of "The Automobile" there was an article by a maker of four-cylinder cars, and in the following issue, an article on the same subject by a manufacturer of six-cylinder cars, in which the latter has taken his four-cylinder opponent so severely to task that, in places, he seems to be hard pressed for material upon which to base a sound argument. As both of these articles were written by manufacturers, perhaps a few words from a private owner, unconnected with the trade, would not be entirely out of place.

Let us consider two motors, one of four cylinders and the other of six, both of the same horsepower. The cylinders of the former would have to be of greater size in order to produce the same horsepower at the same speed. Now the fundamental argument in favor of any type of machine, except in extreme cases, is its efficiency, or, in other words, the ratio of the energy expended in doing useful work to the total energy received. Gas and steam engines are "heat" engines; they transform heat into work, and they are also capable of performing the reverse of this process. The units of heat are called British thermal units, and one B.T.U. is the amount of heat that will raise the temperature of one pound of water one degree; to be exact, distilled water, at or near the temperature of 39 degrees Fahr. temperature, then, of a gas or substance, is the measure of the heat units it contains.

In a gas engine, when compression occurs, the temperature of the gas in the cylinder is raised, and in this case the energy of the moving piston is transformed into heat. When ignition takes place the gas is exploded—the temperature rising several hundred degrees almost instantly—that is, heat units have been added to the gas. It is this heat, or rather part of it, that drives the engine. Under the second law of thermodynamics, the efficiency of an engine like a gas engine may be expressed by the formula $\frac{T-T_1}{T}$, in which T is the temperature of the gas at explosion, and T_1 is the temperature at release or exhaust. It will be clearly seen that the greater the difference of the temperatures at explosion and at exhaust, the greater will be the efficiency, and the greater the number of heat units transformed into useful work—provided it is all expended in driving the piston, and here we come to the important part.

As a matter of fact, only a small portion of this heat expended in the cylinder drives the piston. One authority gives the distribution as follows:

Work indicated in the cylinders	17	per cent.
Heat lost to the cylinder walls	52	" "
Heat carried away by the exhaust	15.5	" "
Heat lost by radiation and conduction	15.5	" "
	100.0	

The power of a gas engine increases as the square of the diameter of the cylinder, while the cylinder wall area does not increase so rapidly, and therefore the larger the bore of the cylinder, the less the percentage of cylinder wall surface there is, and the more efficient the engine becomes.

Applying the above to the two engines of equal horsepower, one of four cylinders and the other of six, the former will have the higher efficiency, as the greatest waste of a gas engine is the heat carried away by the water-jacket. This is strikingly shown by the following table of results from tests on stationary gas engines of different cylinder sizes but of about the same amount of compression:

Diameter of cylinder	9.5 "	14. "
Stroke	18.0 "	25. "
Actual efficiency	.21	.27
Theoretical efficiency	.40	.41
Ratio of efficiencies	.53	.67

Again, the six-cylinder engine will have more friction than the four-cylinder of the same horsepower, for there is the friction of six crank pins, etc., instead of four, and the four-cylinder motor adds to its already better efficiency here.

One might say that the same reasoning could be applied to the two-cylinder against the four. However, with four cylinders there are two impulses for each revolution, the same as a one-cylinder steam engine, and this gives so much better balance than the two-cylinder, and is of such importance, that it outweighs the gain in efficiency and the four-cylinder is to be desired. With the six-cylinder this point does not apply as it would if we were considering eight, for eight cylinders would be equivalent to two steam cylinders.

Few people will deny that two cylinders are better than three. Many two-cylinder cars are built to-day—the Darracq Company is building them—but do you find any three-cylinder motors built this year? Judging from the sad experience of the three-cylinder cars, the future of the six ought to be clearly defined.

The six-cylinder advocate tells us that an engine with six cylinders, of the same size, etc., as four, will develop 50 per cent. more power because it is not a matter of "testing" or "opinion," but "it is the working out of mechanical laws." Mechanical laws may work out to a certain result, but the rub comes when you try to get the same result in practice. Do you get it? The four-cylinder advocate states that after trying to do it, and after testing the matter out carefully for a considerable length of time, that he could not get the 50 per cent. more power. From my own experience, in charge of tests on steam and gas engines varying from 10 to 4,000 horsepower, I should not hesitate to believe the four-cylinder spokesman. And if he, a maker of a successful and reliable car, could not obtain the 50 per cent. more power, is it unreasonable to suppose that another maker cannot do so, when he presumably has not tested it out carefully, since he did not state his results?

Quoting from the columns of "The Automobile" of November 7, page 708: "Six cylinders will be in evidence (Paris), but will certainly not be one of the features of the show. Important speed contests this year, which have much less connection with fashion than automobile shows, have failed to develop any remarkable features in the sixes that are not already possessed by the fours. Leading French makers * * * will produce six-cylinder models, generally as a concession to a popular fad, but not because of any firm belief in their superiority."

Perchance this might explain "Why the public should demand inferior cars (sixes) and still be willing to pay more for them than they do for fours." As the breakfast food man says—"Get back to Nature"—the horse and the greyhound have four, so has the elephant, and here we have usefulness, speed and power, but the six-cylinder man will tell you that this last statement is as irrelevant as carbureters, torque and perpetual motion, and perhaps it is.

E. L. HILL.

Worcester, Mass.

IN DEFENSE OF THE MANY-CYLINDERED MOTOR.

Editor THE AUTOMOBILE:

[998.]—It is with considerable diffidence that I take up cudgels in defense of the motor of more than four cylinders against the attack of Mr. Stearns, in your issue of October 31, both on account of the well-known reputation of Mr. Stearns and also on account of the appalling amount that has been written on the subject. If it will not be considered as dodging the issue, perhaps the eight-cylinder motor may be included in the controversy, as offering a more radical contrast with the four-cylinder than the "six" does.

Beginning with the question of torque, which seems to be the crux of the matter, the four-cylinder motor is deficient, as twice every revolution the torque drops to zero. In addition to this, it must be remembered that during the latter part of the power stroke the power is small and rapidly decreasing. In fact, with standard gearing and engine, very few four-cylinder cars would be able to climb a steady 6 per cent. grade on the direct drive, without the help of the energy stored in the flywheel. Considering the eight-cylinder motor as the other extreme, the torque is found to be almost constant. Firing every quarter of a revolution, one impulse begins long before the preceding one is expended. As a gasoline engine delivers by far the greater part of its power during the first half of the piston stroke, the flywheel in an engine of this type has very little to do, and may be quite light without making any perceptible difference in the smoothness of operation.

The statement that it is utterly impossible to notice any difference in the smoothness of running between the best four-cylinder and six-cylinder engines running at a speed of over 200 r.p.m., may be passed over as a matter of personal opinion, but it is doubtful if everybody would agree with Mr. Stearns after driving behind a four-cylinder and also a six, or, better still, an eight-cylinder, up a stiff grade with an engine speed of about 200 r.p.m.

The declaration that "a six-cylinder motor geared, say, 2 to 1, delivers 12 impulses to the rear axle for every revolution of the wheels" and the following comparison with a one-cylinder motor is presumably a typographical error, but the deductions if of any value rather incline toward a preference for a one-cylinder motor over all others, as the question of torque and balance are ignored.

The statement that the six-cylinder motor used 50 per cent. more radiating surface, weighs 50 per cent. more than a four-cylinder motor of the same power, and the other accompanying statements, are hardly borne out by the facts. Indeed, in airship practice, when maximum power per unit of weight is necessary, I believe the tendency is toward the multiplication of cylinders, even up to eight, twelve, and more, as exemplified by the Antoinette motors. The conclusion that the "six" needs 50 per cent. more care and 50 per cent. more repair bills than the "four" is arbitrary and unjust. The 15,000-mile non-stop record of the Rolls-Royce, the 24-hour record of Mr. Edge in the Napier, and the work of the Hotchkiss may be instanced as pretty fair examples of the reliability of the six-cylinders. The absence of vibration, the constant pulling effort and the dividing of the power into a succession of surging impulses instead of instantaneous shocks rising immediately from zero to maximum so reduces the destructive effect on the entire machine, including not only the engine itself, but also the transmission, frame, body, and tires, that repairs on well-made six and eight-cylinder cars are reduced to a minimum.

The criticism of Mr. Stearns in regard to the excessive length of hood needed for some six-cylinder motors is well taken. However, if an engine is built with eight cylinders, four on each side, 90 degrees apart, it need have no longer hood than many "fours." An engine of this type is almost as far ahead of a "six," in regard to flexibility, as the "six" is ahead of the "four," and as it is a very substantial engine and still light, it may be seen a good deal more of in the future. Although most racing cars are of four cylinders, as Mr. Stearns says, still the fastest time in the world for two miles was made by an eight-cylinder machine of this type.

Carburetion troubles, instead of being increased by the multiplication of cylinders, are practically eliminated in an engine of this type, as suction is so constant as to prevent the irregular action noticeable in four-cylinder engines from different piston speeds, and the sudden cessation of suction at the end of each stroke. This arrangement of the cylinders also lends itself to intake piping of simple and symmetrical form, allows of a crankshaft similar to a four-cylinder one, needs only one camshaft, and brings the center of gravity of the motor and machine very low.

On the whole, Mr. Stearns' most valid objection to the six-cylinder machine seems to be on account of the long wheelbase, and if this can be overcome, and if, at the same time, it is possible to get greater flexibility and greater wearing qualities and reliability, will he still object?

A. G. BROOKE RIDLEY.

Alameda, Cal.

REAL CHAMPIONS OF THE AMERICAN INDUSTRY.

Editor THE AUTOMOBILE:

[999.]—I have read in one of the daily papers that Chairman Jefferson DeMont Thompson, of the A. A. A. racing board, has just placed an order with the E. R. Thomas Motor Company for a racer for his own personal use. If this is true, let all patriotic Americans take their hat off to him, as one of the real champions of the American industry among the wealthier sportsmen.

We have had several millionaire sportsmen, who incessantly talk of their intense interest in the welfare of the American industry, and who have established some of the largest existing tours and races, in order, as they say, to stimulate the American manufacturers and give them a chance to win; nevertheless, these self same men, after making these impressive speeches, take the first steamer to Europe and purchase two or three more foreign machines, even bringing back foreign racers to enter in their own races against American cars. Would they do this if they were sincere? If they were, would they not place their orders with American manufacturers, to help them in their struggle to gain the first rank which foreigners have been holding for years?

It is true we have had a few of these good sportsmen, probably the most prominent of whom is Dr. Harold E. Thomas, of Chicago (who owned the "Locomobile" that made such a wonderful record in the 1905 Vanderbilt Cup race, and thereby proving that at least one American manufacturer could turn out a car that was the equal of the best of the foreigners, if not better), but how few and far between have these men been. Therefore, every patriotic American ought to rejoice that Mr. Thompson has taken up the "good cause," and let them hope that a few of our wealthy sportsmen will follow his excellent example.

AMERICAN WHO WOULD, IF HE COULD, BUT CAN'T.

Boston, Mass.

ACROSS THREE CONTINENTS BY AUTOMOBILE

AT the end of February, or early in March, a group of automobiles will start from Times Square, New York City, bound for Paris via Bering straits and the Continent of Asia. The Parisian journal, *Le Matin*, past-master in the art of organizing world-stunning performances, originated the unique contest and immediately obtained the co-operation of the New York *Times* in the realization of the idea. Although the *Matin* has had exceptional experience in organizing sporting events for its own and the public's benefit, such efforts as making the French army march, running an automobile tour around France, sending a fleet of motor boats from Algiers to the bottom of the Mediterranean, and finally the successful automobile run from Pekin to Paris appear trivial compared with the scheme on which it and the *Times* have now set their journalistic hearts.

New York-Paris has only been made possible by reason of the successful termination of the Pekin-Paris run, and although one may object to the shrillness of *Le Matin* trumpet and prefer fewer "Lisez *Le Matin*" posters, the journal must be congratulated on having proved the impossible possible and for displaying more faith in the automobile than the most enthusiastic automobilist. Five automobiles and one tricar started on the run across Asia and Europe, three of the cars finishing without difficulty, one straggling home very late, and only the tricar being left to whiten its bones on the desert.

To the tremendous difficulties of the 1907 run are added the hardships of crossing the Arctic regions with no other aid than the contestants can mutually grant. Providing, however, that adequate arrangements are made for supplying fuel and supplies along the route of march, there is no reason why the tour should not be successfully accomplished by a good percentage of the starters. The essential is that courageous and resourceful drivers should be selected, and that the machines should be specially constructed and equipped for the difficulties they will have to encounter. Greater road clearance, provision against cold, exceptionally low gearing, special wheels for traveling over ice, portable bridges and the best arrangement of supplies to gain space and weight are some of the matters that will have to be carefully thought out. Lessons learned from the Pekin-Paris run are that while the stores of each competitor must be so complete as to make him self-sufficing in the most complete isolation, weight must be reduced to a minimum. It is important, too, that the contestants should be bound to keep together, at any rate until European centers of civilization are reached. The natural desire to push ahead of slower competitors, dangerous in the Pekin-Paris tour, might be fatal in view of the greater physical hardships of the Arctic regions.

Particulars of the route have not yet been definitely announced, expert opinion still being sought as to the most suitable way of reaching Alaska and crossing the Bering straits. It has been tentatively announced as New York to Chicago, then northward into Canada, following the line of the Canadian Pacific Railroad to Vancouver; or the run may continue across the United States through St. Louis and Denver to San Francisco, then up the coast through British Columbia to Alaska, across the Bering straits, then through Siberia to Moscow, from which point the route will be that followed by the Pekin-Paris travelers. Total distance will be about fifteen thousand miles.

In France the round-the-world tour has been received with enthusiasm, Marquis de Dion, whose two cars finished in the Pekin-Paris run, already declaring that he has ordered the construction of special machines for the event. Paul Lacroix, American agent for the Renault firm, who has just returned from Paris, announces that the Renault Brothers have fully considered the scheme and are decided to put in a car. Other announcements have not yet been made, but it is certain that a representative group of foreign cars will be obtained. America will not be behind, the Hol-Tan company having already made a formal entry, and Thomas and Franklin announced keen interest in the event. As a demonstration of the ability of American cars and American drivers to stand up under the greatest strain ever imposed on man and machine, no better event could be found than the run to Paris. The event will be one which will attract not merely local but world-wide attention, and American manufacturers have too much at stake to allow themselves to be outnumbered at the starting line, or to line up a team in Times Square less suited for the strenuous test than their foreign rivals.

NO DIFFICULTIES WITH ALCOHOL AS FUEL

PARIS, Nov. 25.—An interesting statement regarding the possibilities of alcohol as fuel was presented at the conference being held in Paris during the Salon, by Eugène Brillié, designer of the 140 motor 'buses in use in this city. Since 1900 it has been known that both pure and denatured alcohol could be used for internal combustion engines with satisfactory results, but it has been left to the Paris municipal omnibuses to publicly demonstrate its value. The service was inaugurated on June 11, 1906, and up to date 2,231,000 miles have been covered entirely on 50 per cent. denatured alcohol. In his report M. Brillié stated that they had noted no cases of erosion or pitting of the valves, a defect which has often been attributed to alcohol, and the engine certainly heated less than with gasoline. One drawback of alcohol was a certain difficulty in starting the motor during cold weather, but this could always be overcome by passing a little gasoline through the petcocks. Their experience was that alcohol was just as effective as gasoline, the only question to be considered in its use on commercial lines being the cost of operation. In Paris gasoline cost 56 francs the hecoliter, 20 francs of which was town duty; denatured alcohol cost 39 francs per hecoliter, 5 francs 10c. of which was town duty; the difference in favor of alcohol was thus 17 francs per hecoliter. He estimated that by the use of alcohol a saving of $60,000 had been effected since the inauguration of the municipal omnibus service. Outside Paris the monetary advantage of alcohol was but slight, owing to the lower price of gasoline consequent on the abolition of the *octroi*.

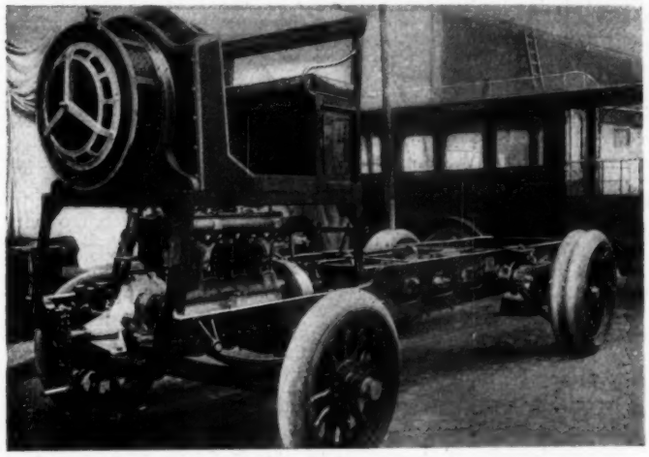
FARMERS CAN SUPPLY DEMAND FOR FUEL.

Reporting on the use of small alcohol stills in France, Consul-General Robert P. Skinner, of Marseilles, says that the distilling process is an exceedingly simple one and that it is possible with a mechanical outfit constructed according to the best modern experience to produce an alcohol of sufficiently high proof to be utilized for light, heat and power from such material as damaged wine and the pulp of grapes, apples, pears, etc., from which the juice has already been extracted. There is no reason either why the cheap stills on the market should not produce alcohol of even greater strength than 90 degrees if required. At present the French farmer is only interested in *eau de vie* of 50 to 70 degrees alcohol strength, but could produce a grade of greater strength if there were a demand for it for industrial purposes. Whether equal results could be obtained from potatoes and grains has yet to be proved. Automobile fuel is available if encouraged.

TWO-CYCLE ENGINES AND ALCOHOL AT SALON

PARIS, Nov. 25.—For the more pronounced departures from the beaten track of automobile design, it is necessary to leave the gorgeous Grand Palais and plunge into the busy hall of machinery on the opposite side of the River Seine; here the many problems connected with commercial vehicles have been tackled, two-cycle and rotary engines have been developed, and alcohol is shown to be reliable as automobile fuel.

More attention than ever before is given to the use of denatured alcohol as fuel, the Automobile Club of France interesting itself in the subject and having its own stand, designed to point out what has already been done in the matter of alcohol as a fuel for existing internal combustion engines. Progress is shown by its employment on the 140 motor 'buses equipped with Eugene Brillie motors, now in circulation on the streets of Paris. At the A. C. F. laboratory eight different motors, comprising a De Dion, Panhard, Dietrich, Aster, Peugeot, Tony-Hubert, Abeille, and Gillet-Forest are being run regularly with either pure or denatured alcohol as fuel.



ELEVATED RADIATOR AND PLATFORM ON TURGAN TRUCK.

Although the commercial position of the two-cycle engine is still very feeble in France, its standing in the technical quarters has been enormously increased. Tony-Hubert, Ixion, René Legros, Peugeot and Mietz & Wiess, all show two-cycle engines, several of them being in motion with gasoline and kerosene. Interest in this type of engine has been considerably increased of late by the efforts of the A. C. F., which has just held a competition at its laboratory. Most distinctive of all at the Salon is the Burlat rotary engine, two models of which are shown, one of 12-16-horsepower with four cylinders, and an eight-cylinder model developing 30-40-horsepower. All cylinders, which are air-cooled, rotate with the crankshaft, ignition being effected by the tops of the plugs coming into contact with an arm extending from the chassis, which conveys the high-tension current as each cylinder makes its connection in passing.

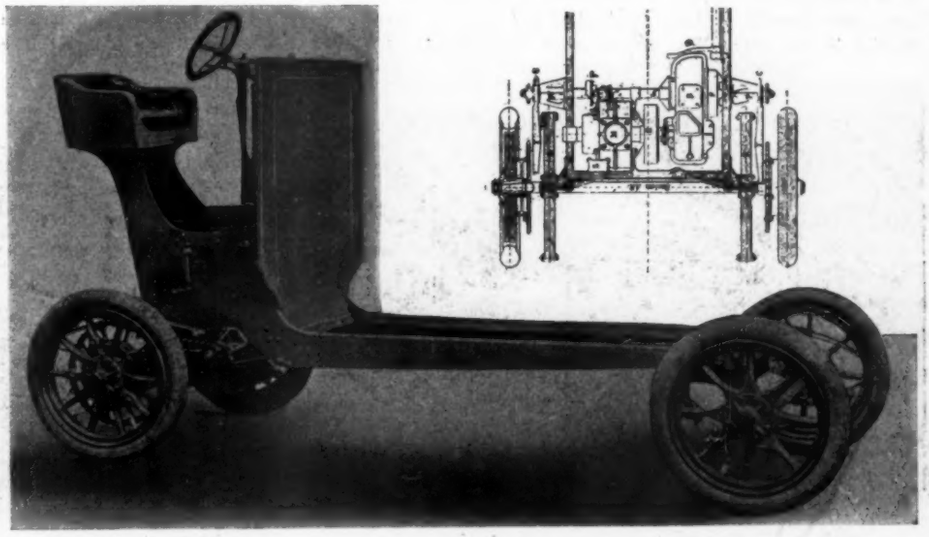
The feature of the industrial section is the showing of vehicles designed for special classes of work—as compared with standard chassis fitted with a commercial body. Delahaye shows an automobile fire engine driven by a four-cylinder motor and operating a Delahaye-Farcot pump. Provision is made for carrying twelve men, ladders, and over 800 yards of piping. A good feature is the mounting of the hose lengths on reels hung to the frame between the road wheels. Several of these vehicles have been adopted by the Paris municipality. Dietrich also shows a fire engine designed specially for use in rural districts, driven by a four-cylinder engine and capable of delivering from 400 to 1,000 liters of water a minute. A larger model, with a 35-horsepower engine, will throw 2,000 to 2,500 liters a minute, only three men being required in the operation. This model has been in use for the past year at Nancy.

Agricultural interests are cared for by one firm only, Turgan & Rusinol, with a 50-horsepower tractor for plowing, and an automobile reaper. The plow is an original construction with three driving wheels, two of which are also steering, fitted with three speeds forward and reverse. The reaper, in addition to its ordinary work in the field, is designed to drive any fixed machines by means of belt connection.

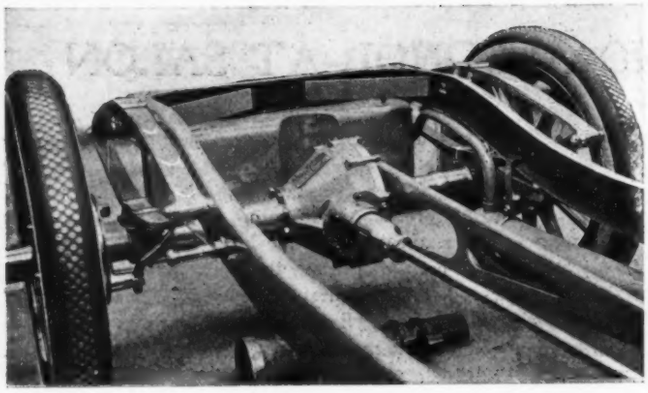
Turgan appears to have solved the question of accessibility in rather an original manner. On one of their heavy trucks the engine is carried forward between the two side members, and two feet above it, supported on four columns running up from the side members, is the driver's platform with the radiator hung on the front of the dash. By removing the two side and the front plates the motor is rendered as accessible as on a shop bench. The arrangement necessitates some changes in the steering gear and in the water piping and pump, but is an excellent design for securing engine accessibility.

About half a dozen different types of tipping trucks are shown, fitted with metal bodies for coal, dirt or stones. On the Orion truck the tipping is performed by means of levers operated by the driver while at his steering wheel. Most of the others have adopted a worm gear by which a five-ton load can be dumped out by one man.

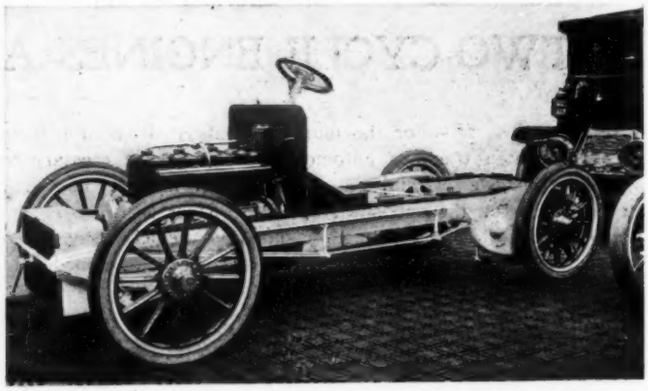
In the light delivery vehicle class one of the most original chassis is the Roval, particulars of which have been published in THE AUTOMOBILE, and which is now illustrated. Briefly, it consists of a single-cylinder motor with its gear set and transmission shaft placed transversely in the frame just forward of the rear axle, and driving the rear wheels through short side chains. A high metal platform above the power plant provides a seat for the driver, while leaving the engine and transmission perfectly



ROVAL LIGHT DELIVERY CHASSIS, WITH ENTIRE POWER PLANT OVER REAR AXLE.



BERLIET HAS FULL ELLIPTICS, SHAFT DRIVE, DROP FRAME.



NEW MODEL OF FOUR-CYLINDER CHAIN-DRIVEN CHARRON.

accessible. Steering is by rack and pinion with connection to the front wheels. The principle is good in that it gives the maximum of space for carrying loads, but it is hardly possible to use it for anything bigger than a two-cylinder engine.

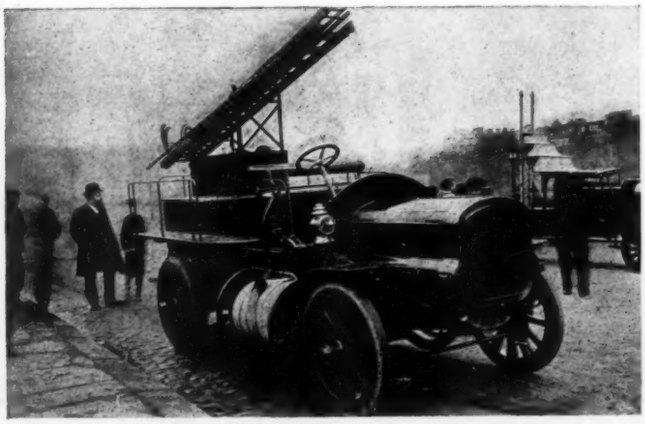
Belt transmission on a five-ton truck is decidedly novel at this stage of development, yet one such is to be seen at the Salon. A two-cylinder horizontal engine developing 12-15-horsepower transmits by a crossed belt to a transverse gear box providing four speeds forward and reverse, final drive being by roller chains to the rear wheels. Instead of a clutch a belt shifting arrangement is provided. The Pantz proved its reliability by covering 1,200 kilometers during the fifteen days of the French army maneuvers without any adjustment.

In the small runabout class—or as the French prefer to call it, voiturette—a new and distinctive type of vehicle has been developed, which if put on a sound commercial basis should give the French a new lease of life in the automobile world. Unfortunately in the majority of cases the small cars, though excellent from a mechanical standpoint, are not produced by firms with sufficient commercial standing to give them more than a local success. There are a few exceptions, as in the Lion-Peugeot, Werner, Darracq, and Sizaire-Naudin, but the majority are likely to go down for want of financial backing, or to find their efforts exploited by outside moneyed interests.

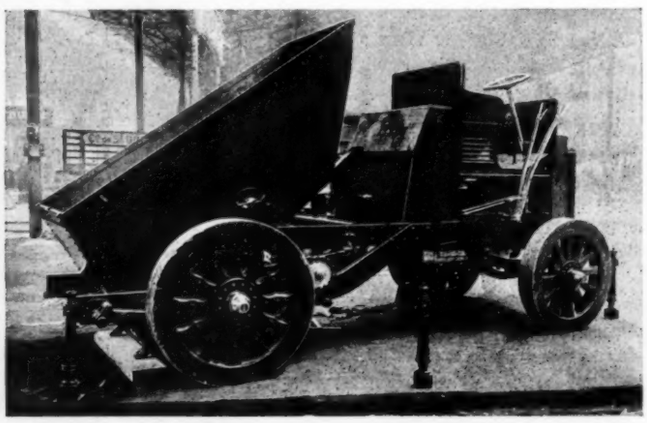
Prominent among these little vehicles listed at prices varying from $500 to $1,000, is the Sizaire-Naudin, typical of its class in having a single-cylinder vertical motor forward under a bonnet, but distinctive in several features of engine design and transmission. As in all these models, a pressed steel frame is employed, with the car well suspended and hung low to give a smart, racy appearance. The Sizaire-Naudin is distinctive in having a transverse front spring, though in the majority of cases the voiturettes have semi-elliptics in front and platform type or three-quarter elliptics in the rear. The power plant consists of a high-speed single-cylinder motor 4.7 bore by 4.3 stroke, water-cooled, with mechanically operated valves, the intake being immediately above the exhaust valve and operated by a rocker arm. Motor control is entirely by variable intake valve, the inlet valve cam being movable on its shaft by means of a lever fixed on the steering wheel. Ignition is by high-tension Simms-Bosch magneto with fixed sparking point. Thermo-syphon water circulation is employed through a tubular radiator without fins, surmounted by a large capacity water tank.

In both clutch and transmission the Sizaire-Naudin has distinctive features, excellent because of their simplicity and consequent low price of production, and their reliability as shown in tests. A special type of disk clutch is employed, and the gearbox and differential are contained in a single housing on the rear axle.

In the majority of the voiturettes standard lines of construction have been followed more closely, the machines being but miniatures of large touring cars, with such standard features as disk clutch, sliding gear transmission and shaft drive. There is one case of a selective transmission on a single-cylinder car, and a single case of transmission by friction disks; planetary transmission, too, has one supporter. Lion-Peugeot is distinctive in employing side chains for final drive for both the two-cylinder and single-cylinder machines. Side members and body in a single stamping, which offers considerable attractions for a cheap production, has not found the number of supporters expected of it. Darracq has adopted this type of construction for the new single and two-cylinder models, and some examples of this type of construction are found on the metal-workers' stands, but it does not appear to have been adopted by other constructors. The accepted principle appears to be to stamp out one seat with each side member, uniting them together when the frame is built up with the cross members. The construction is one of the strongest possible, can easily be upholstered, and allows of enameling instead of painting and varnishing; its cost, too, is low.



DELAHAYE AUTO FIRE ENGINE AS USED BY PARIS BRIGADE.



BERNA FOUR-CYLINDER TRUCK WITH PIVOTING BODY.

WHAT AMERICAN VISITORS SAW AT LONDON'S BIG SHOW

By ALFRED REEVES, General Manager, American Motor Car Manufacturers' Association.

LONDON, Nov. 18.—Two Americans direct from the New York shows can hardly visit a big exhibition like the one now in progress at the Olympia without observing many new things and being impressed in particular with the importance of American makers sending their representatives to the English and French shows. While there are many things we can teach the foreigners, especially in the matter of general appearance and method of marketing, we can also learn a great deal from our English cousins. This much was proven to me beyond argument after a week at Olympia in company with Howard C. Marmon, the designer of the Marmon car and a member of the technical committee of the American Motor Car Manufacturers' Association.

The exhibition here is for two weeks, and there is a decided difference of opinion as to the worth of so long an affair. Most exhibitors declare one week to be enough. The automobile makers have decided against many of the opposed local shows, declaring in favor of one big exhibition, just as American makers favor. There is a little talk of giving up shows, but very little. Olympia has been taken again for two years as the place for shows here. It is generally agreed that nothing would be more harmful than a failure to hold the annual exhibition. The attendance at Olympia has run from fifteen to twenty thousand a day.

No one can visit the 140 car exhibits at this show without being impressed with the dominating influence of the small car. It is seen everywhere on the streets and apparently is taking the lead. The favored types seem to be those of four cylinders of from 10 to 20 horsepower, with a seating capacity of four. There are some students of auto building here who declare the car to make now is either a small one for the man who does not have a chauffeur, or a very large one on which a chauffeur is absolutely necessary.

I was very glad to see a feeling of conservatism in the trade, without pessimism. It is generally agreed that a little toning down of business is necessary and will be beneficial, but our English friends say they cannot see where there is going to be any great falling off in trade. Nevertheless they have discounted a good portion of any falling off by a general reduction in prices, averaging about 25 per cent. This is rather a big cut, and it applies pretty generally. The makers believe it warranted by the large production of cars and a lower cost of manufacture.

Olympia show is twice the size of anything held in America. The stands are all individually decorated, supplying a novel effect though of course rather costly. Next year will see uniform decorations for the building and the stands, just as we have in America. There are four American cars shown—the Ford, White, Cadillac, and Buick. There was always a crowd at the Cadillac, which has a good reputation here, and at the White stand, for the steamer has been unusually successful in England. Those Americans who were here had the first opportunity along with other visitors of seeing the Ford line, and, as might be expected, the low prices create a sensation. The new four-passenger light touring car and the taxicab or town car were constantly surrounded by visitors. Among a score of other things which Americans would notice at the show were:

Every stand showing a shaft-drive car except Mercedes.
Entire lack of runabouts with rumble seats, except the Buick.
Adjustable foot pedals.
Tubular front axles even on heavy cars.
Many advances in coach work.
Almost total disappearance of the cone clutch.
The appearance of a couple of buggyabouts.
The increased use of the motor as a brake.
Lack of interest in self-starting devices.
A growing practice of abolishing the spark adjustment on the wheel.
An unlimited fancy in radiator designs.
General cleaning up of dashboards.
Change in the carbureter, locating the auxiliary air valve from the manifold.
A tendency to lengthen rather than shorten wheelbase.
The use of three bearings on transmission shaft.
Increased use of shock absorbers as general equipment.
Ratchet sprags on transmissions.
The fastening of crankcases without the use of arms.
Three-quarter elliptic springs on the rear.
Grease cups on ball-bearing steering joints.
Hand adjustment of brakes.
Thermo-syphon system of cooling on town cars.
Casting of four cylinders in one on small cars.

London itself is a city of automobiles, ranging from the motorcycle to auto drays, carrying loads of coal. There are 800 taxicabs in successful operation in the streets and 200 or 300 motor 'buses that are having a hard time standing up under the terrific trials they have to go daily. The roads around England call for enthusiasm from the American, for they are simply ideal. Among the Americans at the show this week were noticed Walter C. White, Russell Huff, and Howard Coffin.

FIRST IMPRESSIONS OF FRENCH DECENNIAL SHOW

By ALFRED REEVES, General Manager, American Motor Car Manufacturers' Association

PARIS, Nov. 23.—Though the London show was a great automobile event, the Paris Salon eclipses it and is certainly the finest thing of its kind the world has ever seen. The thousands of lights under the roof of the Grand Palais make up a decorative scheme which is par excellence, and the automobiles on exhibit comprise the finest constructions in the world. One feature of the exhibition is the great foreign demand for low priced and medium priced cars; while in some respects the foreign cars are superior to those constructed in America, in the medium priced class we are equal to if not better than the foreigner. There is no dearth of enthusiasm here among the automobile purchasing public, and sales will certainly equal those of last year, especially in medium priced cars. All Paris is alive with the Salon, the show being organized on such a scale that it is impossible for any individual to be unaware of its existence. During the busy hours of the afternoon the crowd is so great that at times further entries have to be refused. To judge from the crowds in the Champs-Elysées on Sunday, all Paris is bent on seeing the show.

FORD PLACES AN EXCLUSIVE FRENCH AGENCY.

Paris, Nov. 25.—Henry Depasse, one of the best known of French sportsmen, who in the bicycle days won fame under the name of Dary, has obtained the exclusive agency for France of Ford runabouts. A few years ago Depasse founded the Elysée Automobile Palace in the Avenue des Champs-Elysées, and it is here that the American runabout will be shown. The little four-cylinder car will be marketed in France at $780. Other American firms having agencies in Paris are Oldsmobile, represented by H. de la Fresnaye, and Mitchell with a garage in the suburbs.

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Certainty of Sounder Health in Auto Industry. There are some men who are so constituted that they gaze out upon the world through a thick and mournful haze, as it were. To them every cloud is a black one and every omen one portending evil to come. In common with all others, the automobile industry has its share of these pessimists and calamity howlers, and probably it always will, but it is doubtful if they will always be granted the opportunity to give vent to their dolorous wailing at the expense of the industry that supports them, as has been the case during the past half year or so. The inexorable law of the survival of the fittest will make its influence felt no less surely in their case than it does in that of others, although the process may be a slow one.

To any one who will take the trouble to look beneath the surface it must be evident that there is really less reason for indulging in a streak of pessimism regarding its future than there ever has been during its short but marvelous career. As an industry that has catered almost exclusively to the man who invests for pleasure alone, it has suffered less from the recent financial depression than any other similarly situated, and, all things considered, the outlook for a successful business year during 1908 could not be improved without changing the face of things in general.

It must be borne in mind that, unfortunately, the recent slump took the industry at its worst—at a time when it was going through a period of transition, passing from the status of the "automobile game" to that of a well-settled business in which the great big hip, hip, hurrah style of proceeding will no longer figure prominently. Then why not take things at their par value and realize that, while there may be a portion of the industrial body diseased, it is rapidly being cut away and that the eventful result will be sounder health in the automobile business than has ever before prevailed. Dyed-in-the-wool pessimism never helped anybody or anything, and never will.

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Changing Standards of Automobile Suspension. There have been two epochs, so to speak, in the history of the American automobile. The first, in which design and development were entirely in accord with purely American ideas and long independent lines—in short, a period in which foreign ideals were looked at askance, and the average American builder was determined to evolve a distinctive type of his own. The second, in which these ideals were thrown overboard and foreign standards closely patterned after. In common with other features of design, the suspension has changed with the varying standards followed. Primarily, the American car closely followed the carriage maker's idea of springing and double-elliptic springs were common. They gave way later to the long semi-elliptic with its new methods of placing and attachment to the frame that the continental designer had introduced, and now it is noticeable that there is a more or less general reversion to former standards for reasons that are not hard to understand. The semi-elliptic spring is extremely sensitive, but its range of action is correspondingly limited, and this fact was responsible for the creation of the now familiar shock absorber, for the semi-elliptic is not capable of absorbing unusually heavy shocks, particularly when they follow one another quickly. To overcome this, foreign designers have increased the length of the spring until it now measures a third or more of the length of the frame, and while its sensitiveness is correspondingly enhanced, and its "good road" action proportionately improved, its adaptability to rough road work is not such as to make it the equal of the full-elliptic spring, which is again coming more and more into vogue with the American designer. The platform type of suspension is likewise finding renewed favor, on the part of both foreign and American designers, though it will be recalled that both have tried it and abandoned it in earlier days. Where the American builder is concerned, it is merely a case of coming to a realization of the fact that what is suitable for the good roads of the Continent is out of place on their American counterparts, and designs must be altered accordingly.

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The Plain Truth and a Certain Remedy. After a close study of the features of the present financial disturbance, the American Trade Press Association has arrived at the gist of the matter in the following resolution, which, among others, was adopted at a special meeting of the Association:

That the so-called business depression is due principally to a want of confidence which is unwarranted by agricultural and industrial conditions, and that one of the worst results of the panicky feeling that prevails is the hoarding of money, in which many banks are principal offenders—many holding much more cash than the reserves called for by the banking laws, and setting a most hurtful example to individuals.

Official figures are not wanting to prove the soundness of the Association's summing up of the situation. They are found in the $1,434,000,000 imports during the fiscal year of 1907, compared with $1,227,000,000 during the same period of 1906, and $765,000,000 in 1897; in increased exports from $1,718,000,000 to $1,854,000,000 during the last financial year. Records for production are equally satisfactory: thus for 1906, the last year for which figures are available, pig iron had increased 2,000,000 tons during the twelve months; petroleum production was 5,333,000,000 gallons against 2,500,000,000 a decade earlier; the number of cotton spindles in operation in mills of the Northern States was 15,666,000 against 13,900,000 in 1897; in the Southern States the figures for the same relative periods are 9,000,000 and 3,250,000.

VANDERBILT CUP RACE TO BE HELD IN 1908

THERE will be a race for the William K. Vanderbilt, Jr., Cup in 1908. Exact date and location of course may not be announced before July 1, though conditions may make possible earlier publicity. At any rate, a race will be held, and the manufacturers may count upon the event for October next.

After the executive committee of the A. A. A. Racing Board had had a session on November 27 at A. A. A. headquarters, No. 437 Fifth avenue, and disposed of many routine matters, it resolved itself into a meeting of the Vanderbilt Cup Commission. Recognizing the need of an early announcement, it was decided to take the bull by the horns and decide upon the holding of a race for the cup in 1908, assurances from various sources justifying the commission in reaching its decision.

The official announcement contains these facts, though the rules will be given further consideration before being made public:

Competition for this cup, under the terms of the deed of gift, is open only to clubs that are recognized by or affiliated with the American Automobile Association, or to clubs likewise related to the Automobile Club of France, and not more than ten cars can represent any one competing country. No car shall be allowed to compete for this cup whose weight shall exceed 1,100 kilos, or 2,424.4 pounds, instead of 1,000 kilos, or 2,204 pounds, as heretofore, and must carry two persons seated side by side, whose weight must not be less than 132 pounds each. Each car must be manufactured in its entirety in the country which it represents.

The club winning the trophy is obligated to deposit with the American Automobile Association a bond of not less than $3,000 for the safety of the cup. The entry fee will be $1,000 for each car, which covers the elimination and final events, and entries received after the closing date, September 1, 1908, and before October 1, 1908, will be doubled, making the fee $2,000. No entries will be received after October 1, 1908. The race shall be for not less than 250 miles, nor over 300 miles.

Before taking up its duties as the Vanderbilt Cup Commission, the board unanimously adopted this resolution:

Resolved, That it is the sense of this meeting that the Racing Board approve the sportsmanlike action of the Automobile Club of America and the Florida East Coast Automobile Association, in their endeavor to resuscitate high class racing on the Ormond-Daytona Beach; and further, we assure both clubs of our hearty and earnest support.

Present at the meeting were Jefferson deMont Thompson, chairman; Dave H. Morris, Frank G. Webb, A. R. Pardington, A. G. Batchelder, A. L. Riker, technical advisor; Frederick H. Elliott, secretary.

A. A. A. ANNOUNCES TECHNICAL BOARD.

Announcement has been made by President William H. Hotchkiss, of the American Automobile Association, of the appointment of the new Technical Board of that body. Waiving his right to nominate the members to the president for appointment, Chairman N. H. Van Sicklen requested President Hotchkiss to select such persons as he thought were best qualified to perform the work of the Technical Board, the appointments being, therefore, with the exception of the present technical advisors of the Racing Board, E. R. Thomas, A. L. Riker, and Henry Ford, largely the nominees of the various State associations. The composition of the board is as follows:

N. H. Van Sicklen, Chairman, Chicago.
David Beecroft, Chicago.
H. O. Smith, Indianapolis, Ind.
Edgar Apperson, Kokomo, Ind.
Walter C. Baker, Cleveland, Ohio.
Henry Souther, Hartford, Conn.
S. N. Colburn, Minneapolis, Minn.
E. R. Thomas, Buffalo, N. Y.
Clarence E. Whitney, Hartford, Conn.
E. T. Birdsall, Rochester, N. Y.
Angus Sinclair, Newark, N. J.
J. C. Kerrison, Boston.
Henry Ford, Detroit, Mich.
H. M. Rowe, Baltimore.
A. C. Newby, Indianapolis, Ind.
A. L. Riker, Bridgeport, Conn.
Roy F. Britton, St. Louis.

It is quite probable that the present membership of seventeen will be increased by nominees from the affiliated clubs and State associations. David Beecroft, of Chicago, has been suggested by President Hotchkiss for the post of secretary and vice-chairman. The first meeting of the board will be held at Chicago on December 6, when it is expected that plans will be laid for a number of technical contests in different parts of the country during the coming season.

The French Minister of Public Works has called a conference to be held in Paris in November of next year, to consider road question developed as the result of the growth of automobile traffic; new methods for new conditions will be the theme of the gathering. The Touring Club of France and the national automobile club are taking an active part in the organization of the meetings, delegates being expected from all countries.

EUROPE OUTLINES A FULL PROGRAM.

PARIS, Nov. 25.—Dates for the most important European automobile events were decided upon at the calendar congress held at the A. C. F. temporary clubrooms in the Grand Palais and attended by representatives from all European automobile associations and organized bodies. The congress, the third annual one held in Paris, is intended to mark out as near as possible the sporting program for the year without clashing of interests. From January 18 to February 2 the Automobile Club of Italy will hold its international exhibition. Events in March will be the automobile week at Nice and a number of local contests in the south of France. Monaco motor boat races have been fixed for April 1 to 13, followed by yachting and cruising events, and on April 25 the French commercial vehicle tests will commence, ending exactly a month later. Important meetings in May will be the Targa Florio on the 10th and the Moscow exhibition. The Royal Automobile Club of Great Britain has fixed on June 1 to 18 for its reliability trials. During the first fortnight of July—the exact date has not yet been decided on—the Automobile Club of France will hold its Grand Prix race, probably at Dieppe. Ostend races will be run off from the 13th to 17th and races on the Ardennes circuit for racers and touring cars will occupy July 20 to 30.

The Coup de la Presse in Normandy, Ostend motor boat week, Evereaux speed tests, Paris-to-the-Sea motor boat race, Salon straightaway tests and Mont Ventoux hill climb will be the outstanding features of August. During September *L'Auto* will run the voiturette race, motor boat races will be held at Arcachon and the Italian clubs will organize commercial vehicle tests. Near Paris motor boats will race on the Seine and all classes of cars will climb Chateau-Thierry hill. October events are the Gaillon hill climb in France and the Royal British clubs only speed test under limited cylinder rules.

At the international conference of automobile clubs, attended by representatives from all countries but America, an international formula for touring car competitions was referred to a special committee. What to do with two-cycle engines and those of the Gobron type in races under the international 155 millimeter rule was settled by leaving the formula to be adopted by the technical committee of the A. C. F. Complaints were received from drivers on the danger to eyesight from the present system of tarring race tracks. The next meeting is announced for Paris in May.

"MOTORING" MORGAN SHOULD ASK MR. MORRELL

By an A. A. A. MEMBER.

ONCE upon a time the auto department of the New York *Globe* contained news matter. Nowadays it serves principally as an avenue for "Senator" Morgan to vent his spleen upon the officials of the American Automobile Association, possibly because the New Jersey Automobile and Motor Club, of which he was once a prominent member, does not designate him as one of its directors to the State association and also on the national board of directors. Herewith is a recent sample of what the "Senator" considers "news" for *Globe* readers:

"The question whether the membership of the American Automobile Association would approve the spending of their money in a race meet speculation is another matter, but they were not consulted in the Morris Park meet in 1903, of which there has never been any definite financial statement made. If the A. A. A. is to enter the lists as a promoting body it would seem that it should first consult the membership of the association, as running race meets is not altogether a financial certainty, unless it happens to be a Vanderbilt road race, which was made a success before the A. A. A. took hold of it."

In view of the fact that the Morris Park meet referred to was conducted in July, 1905—not—1903—when Robert Lee Morrell was chairman of the A. A. A. Racing Board, Alfred Reeves, the manager of the track, and Dave Hennen Morris, president of the Morris Park Motor Racing Club, the suspicious "muck-raker" of automobiling is referred to these three for "facts," which when printed should prove as great a "mare's nest" as the well-meaning but erratic "Senator" has unearthed in other directions. By all means have the financial statement made public.

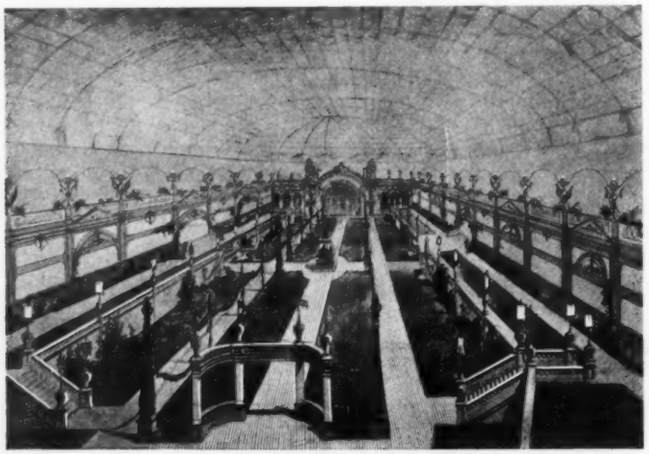
While the successful conduct of all organizations requires the election of directors and the delegation of power to them, it might be that if the entire membership were consulted by a referendum on all questions the transaction of business would be facilitated. But a majority seem to hold to a contrary opinion. In support of this is the recent acquiescence of Automobile Club of America members (who were not consulted) in accepting as a matter of course the action of the club's governors directing the contest committee to take complete control of the 1908 Ormond-Daytona races, though Florida papers recently stated that "Motoring Morgan is in full charge of this tournament." When the A. A. A. Racing Board was some time ago approached by ex-President Asa Paine, of the Florida East Coast Automobile Association, looking forward to the adding of the Florida meet to the two other A. A. A. national fixtures—Vanderbilt Cup race and Glidden Trophy tour—one condition insisted upon by the Board was that it should have a free hand, unannoyed by any "tournament manager." Realizing that meager profits—if any—could not now be expected from two Florida races, the Racing Board's consideration of the matter was actuated simply by a desire to give makers, and also amateurs, opportunity of competing under assured conditions. With the F. E. C. A. A., even though it were through the clever manipulations of "Motoring" Morgan, accomplishing an arrangement with the A. C. A., that solution found ready acceptance by the national organization, which will assist its biggest club member in whatever way it can to insure a success, it being positively announced by the club that it alone has charge of the affair.

"Motoring" Morgan's reference to the Vanderbilt race is as erroneous as his other statements. The A. A. A. Racing Board, the executive committee of which constitues the Vanderbilt Cup commission, has conducted the three cup races held thus far, and therefore it couldn't have been "made a success before the A. A. A. took hold of it." With A. R. Pardington, the chairman in 1904; Robert Lee Morrell, in 1905; and Jefferson deMont Thompson, in 1906, the race has been in capable hands, as it will be again in 1908, with Mr. Thompson as chairman and Mr. Pardington a member of the board, to which Mr. Vanderbilt also belongs.

AN ARTISTIC SETTING FOR IMPORTERS' SHOW

FOR the decorative scheme of Madison Square Garden during the Importers' Salon, opening December 28, the artist in chief has set himself the task of reproducing a scene on a fête day in the Avenue des Champs-Elysées, Paris. Although the illusion as shown by the designer's sketch is not very convincing, a decorative scheme appears to have been adopted worthy of the artistic home of most of the coming tenants.

The floor plan of the Garden has been so altered for the Importers' Salon that there will be a wide aisle down the center parallel to which and on either side will be two other aisles. The same amount of floor space will be available as before, but without the impediment of overhanging balconies and other obstructions. On the ground floor will be housed all the car exhibits, the platform encircling the arena and the mezzanine floor just above it being given over to the accessory exhibits. The top gallery will serve as a spectators' gallery and as a café, the gallery at the Fourth avenue end, usually set apart for visitors, being occupied entirely by the large canvas mural decoration.



HOW THE BIG GARDEN WILL BE DRESSED FOR THE IMPORTERS.

Entrance to the Salon will be from the foyer through a Louis XIV gateway with a canopied ceiling, into the refined beauty of the ivory and blue hall. Entrance to the main aisle will be through a semicircular façade adorned with electric lights. In the center of the hall a sculptured group will be erected, the main figure of which will embody the "Spirit of Speed" delineated in "Pal's" advertising poster of the Salon, the same motive being adopted in the decoration of the gateway and the panels. At the extreme Fourth avenue end the central aisle will terminate in a fountain more than thirty feet in height, on each side of which will be a peristyle of columns capped with glowing lights.

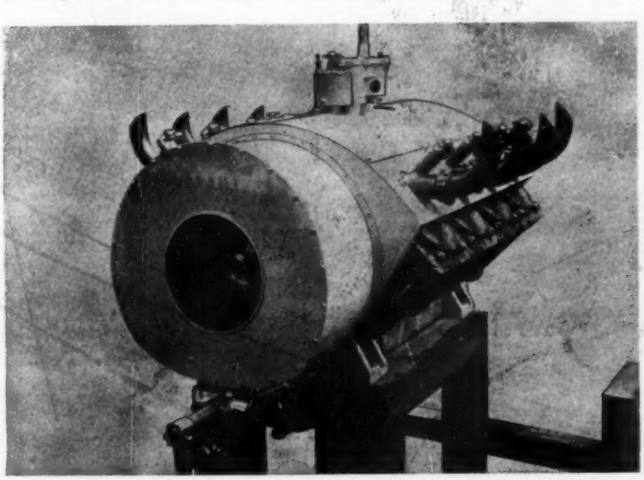
There will be no exhibition in the concert hall, this part of the building being intended as a real garden in which natural flowers and palms are promised and where wicker chairs will invite the weary to rest. On the top gallery of the main hall visitors may lounge and sip coffee and, in imagination at least, enjoy the gay scene of the Champs-Elysées in its gayest and choicest setting. S. R. Ball, the well-known decorator, will prepare the Garden for its imported tenants and American visitors.

PISCHOFF AEROPLANE, DRIVEN BY ANZANI MOTOR PREPARING FOR TRIAL FLIGHT NEAR PARIS.

AEROPLANE FLEET STILL GROWING IN SIZE.

PARIS, Nov. 25.—Still another unit has been added to the aeronautical fleet of Paris, and has made its debut on the common training ground at Issy-les-Moulineaux. The aeroplane, built for M. de Pischoff by the Chauvière firm, is of the cellular type, driven by a two-cylinder Anzani motor carried forward and coupled direct to a two-blade aluminum propeller. The pilot is placed immediately behind his power plant and between the two bearing surfaces, an inclined column and automobile steering wheel giving communication with the rear road wheel and the rear cellular rudder. While running at three-quarter speed on the second day of the tests Pischoff collided with a tree while trying to avoid a group of soldiers, with the result that the rudder was smashed and one of the road wheels collapsed, the pilot being thrown to the ground without injury.

Officials of the Aero Club of France are having a busy time attending to all the engagements for the $20,000 Deutsch-Archdeacon prize and record flights of 150 meters. Henry Farman is still favorite, for he has already practically covered the closed kilometer in practice flights, but is closely pressed by a dozen others, all training for aerial supremacy. While testing his aeroplane at Buc, Esnault-Pelterie was agreeably surprised by a visit from the *Ville de Paris*, with Madame Kapferer, among others, on board. A descent was made, greetings were exchanged, and M. and Mme. Kapferer descended, Comte de la Vaulx took their place and the aerial yacht continued its trip.



RENAULT EIGHT-CYLINDER AIR-COOLED ENGINE.

AERONAUTICAL SCHOOL FOR NEW YORK.

Instruction in aerial science, at present confined to a few schools in Paris, Lyons and Bordeaux, is promised for all by a correspondence class to be opened in January as a branch of the New York School of Automobile Engineers, in West Fifty-sixth street, New York City. Albert Triaca, one of the instructors at the school of automobile engineers, believing that interest in aerial navigation will become even greater than that in automobile matters, has made a close study of the science and is now perfecting details for a course of instruction by correspondence which will offer all the advantages to be obtained by attendance at the European centers. With this object in view he has visited France and obtained the collaboration of some of the leaders in the aeronautical world, among them being Colonel Espitallier, vice-president of the international aeronautical commission. An important matter in the study of the science of aeronautics is that close touch should be kept with the work of experimenters; this has been arranged for in such a way that as developments are made and experiments succeed, the results will be communicated to the school and through the course to all students.

Mr. Triaca, who returns to this country shortly, will bring with him a collection of models of aerial machines, a library of aeronautical works gathered at the suggestion of George Besançon, secretary of the Aero Club of France, an Antoinette eight-cylinder motor for aerial work, and will represent such well-known constructors as Mallet and Chauvière. The course to be commenced in January will be entirely by correspondence; it is hoped, however, to give class instruction at an early date, and to arrange for ascensions, probably under Charles Levée, of the French Club.

EIGHT-CYLINDER AERO ENGINE BY RENAULT.

PARIS, Nov. 25.—The new aerial motor produced by Renault Frères, and now shown at the Salon, is attracting considerable attention in aeronautical circles. It is an eight-cylinder air-cooled engine, with cylinders placed in V and slightly offset. The valves, all mechanically operated, are superimposed, the exhaust valves being in the cylinder head and operated by rocker arms. In the angle formed by the cylinders is the carbureter and all intake piping, and the connections to the spark plugs, each one of which is placed immediately above an inlet valve. The high-tension magneto is bolted in an inverted position immediately below a forward extension of the crankshaft. Above it is a high-speed fan drawing in a strong draught of air to the cylinder walls, the housing around the engine being designed to give the best distribution of the forced draught.

FRENCH WAR BALLOON AN AERIAL DERELICT.

PARIS, Dec. 1.—All France is mourning the fate of the *Patrie*, finest unit of the army aerial squadron and undoubtedly the most successful dirigible balloon ever built, now a helpless aerial derelict somewhere over the Atlantic. While some repairs were being effected on her engine at Verdun, Saturday, a strong squall of wind flattened the airship down to earth and gave the 200 troopers a busy time holding onto the guy ropes. Before they could recover themselves a second and stronger squall caught the air ship and carried it skywards despite the efforts of the clinging soldiers. One by one the men dropped off, and, freed from all restraint, the balloon shot skyward and headed towards Chalons, sailing majestically, notwithstanding that the valve rope had been pulled and gas was escaping.

Automobiles immediately chased after the balloon, and telegraph orders were sent to the Atlantic naval stations to keep a lookout for the passage of the ship. The only news that was received, however, was a message from Lloyds signal station at Tarr Head, Ireland, to the effect that the *Patrie* had been seen drifting northward at the rate of about six miles an hour, and all hope of saving her had therefore to be reluctantly abandoned. The Government is considering the offer of Henry Deusch de la Meuthe to place his private airship *Ville de Paris* at the disposition of the army authorities pending the completion of the *Republique*, sister ship to the *Patrie*, now building. Indignation is strongly mixed with the sorrow at the loss of the French airship, and an official inquiry will be held to fix the responsibility for the loss. The envelope of the *Patrie* was made in Germany by the Continental Caoutchouc Company, the design, however, being the work of French engineers. German authorities are reported to have endeavored to obtain the secret of her success, but in vain. Only a few days ago the *Patrie* made a non-stop run from Paris to Verdun, her military station on the eastern frontier, covering the 150 miles in seven hours, proving as steady in a strong breeze and at a twenty-mile-an-hour gait as an Atlantic liner. Her motor is a four-cylinder Panhard.

Latest news received of the *Patrie* is to the effect that she has been seen passing over Clydebank, near Glasgow, in a northwesterly direction.

DRAWBACK ALLOWED ON EXPORTED FITTINGS.

WASHINGTON, D. C., Dec. 1.—Regulations have been issued by the Treasury Department providing that on the exportation of automobiles manufactured by Brewster & Company, of New York, with the use of imported woolen carriage cloth, plate glass, metal fittings, metal chains, rubber tires, and other imported parts and materials, a drawback shall be allowed equal in amount to the duties paid on the imported parts and materials so used, less the legal deduction of one per cent., except in the case of leathers manufactured in the United States from imported hides, on which an allowance of 100 per cent. of the duty paid on the portion of the hides so used is granted by law. The drawback entry must show the total number of automobiles exported, the number of imported parts, chassis and tires, and the amount of other imported materials of various kinds.

ARMY TO EXPERIMENT WITH AUTO TRUCKS.

WASHINGTON, D. C., Dec. 1.—It is stated at the War Department that experiments with a view of determining the practicability of extending the use of automobiles in the army are in contemplation by the Quartermaster General. Automobiles have been employed to some extent, such as for passenger transportation, for headquarters in the field, signal corps wagons, and ambulances. Now the army officers have in view tests to demonstrate the efficiency of motor-driven vehicles for transportation of heavy stores in the field, under all conditions to be met in the service, such as hilly country, bad roads, and long distances from sources of supply of fuel.

NOW THE AUTO HAS INVADED THE STAGE.

Under the name of "The Auto Race," the New York Hippodrome is running a play only possible on the immense stage with which this house is equipped. The spectacular features of the play are based on the Vanderbilt Cup race, and to the automobilist the show is interesting in exhibiting the ingenuity of the modern stage manager in overcoming the obstacle of presenting the modern vehicle in action in a public building. The opening scene shows a road on Long Island with people arriving in automobiles, sight-seeing cars, and other vehicles to witness the race. An idea of the immensity of the production may be judged by the fact that there are six White steamers, a huge electric sight-seeing car, and the three racers on the stage at one time, the latter cars being property vehicles built on the lines of the big racers. The White steamers run on the stage under their own power, and one wonders how the law against gasoline is overcome. It remained for Edwin Wakefield, the property man of the house, to solve the problem. Each of the steamers is equipped with a tank of compressed air and it is this medium which furnishes the power. The start of the race is a brilliant scene, but it lacks the dramatic ensemble of the exciting scene which early morning visitors of the real race witnessed, and a number of changes are now being made to bring the effect out stronger.

Though this is not the first time real automobiles have appeared on the stage, several being used at a Broadway theater producing "The Vanderbilt Cup," it is the first time such a large and realistic display has been attempted.

WILMINGTON HOLDS ITS FIRST BEACH RACES.

WILMINGTON, N. C., Nov. 20.—It was at first intended to hold the Wrightsville Beach auto races, organized by the Wilmington Automobile Club, on Thanksgiving Day, but as the tide waits for no man, and the beach surface would have been impracticable at the hours desired on that day, the date was advanced to Saturday, November 23. The beach course at Wrightsville is a trifle over a mile and a half in length, and, in spite of the threatening weather, the course was well lined with spectators who saw some good sport. Four events were on the program, two of which were open to Maxwell and Ford runabouts respectively, the former being won by Frank Herbst, and the latter by J. E. Platt. The third event was between the winners of the preceding events, and was won by Mr. Herbst in his 15-horsepower Maxwell in 2:04 1-5, the distance driven being the length of the course.

The fourth event was for a mile with flying start and for a championship medal offered by George Honnet, Jr. The Maxwell runabout, with Mr. Herbst at the wheel, was again a winner in 1:23, with Fred Dock, in a Ford, second. The successful manner in which the races were conducted means that several events open to automobilists in the State will be arranged for the beach course in the near future.

FRANK HERBST IN HIS WINNING MAXWELL AT WILMINGTON.

THREE DAYS OF AUTOMOBILE ENDURANCE.

(*Continued from page 848*)

No. 20. Studebaker. Points lost: exhaust cut-out repaired, 4 points; oil cup lost, 4 points; wheel belt broken, 8 points; total, 16 points. Official weight, 2,905 pounds. (Protest has been filed by local representative.)

No. 28. Kisselkar—Points lost: frame and engine bolt loose, 2 points; emergency brake not adjusted, 4 points; shield fastening bolt broken, 4 points; bonnet clip broken, 4 points; total, 18 points. Official weight, 2,965 pounds.

No. 36. National—Points lost: headlight screw loose, 4 points; muffler separated and hanging, 14 points; crank bracket loose, 2 points; gasoline tip loose and leaking, 2 points; loose lamps, 4 points; total, 26 points. Official weight, 3,100 pounds.

No. 32. Silent Knight—Points lost: lamps loose, 8 points; oil pipe off, 8 points; drag-link replacement on drive shaft, 20 points; joint cover loose, 8 points; work on lamps, etc., 10 points; total, 54 points. Official weight, 3,325 pounds.

No. 2. Pierce-Arrow—Points lost: brakes, 26 points; emergency brake, medium, 2 points; lamp loose, 2 points; seal broken, 25 points; total, 55 points. Official weight, 3,490 pounds.

No. 11. Jackson—Points lost: battery wire repaired, 25 points; battery dead, 4 points; steering gear loose, 8 points; strut rod work, 4 points; seal broken, 25 points; total, 66 points. Official weight, 2,700 pounds.

No. 34. Locomobile—Points lost: brake repair, 10 points; spring shackle work, 16 points; battery dead, 2 points; grease cup loose on jackshaft, 6 points; horn out of commission, 8 points; seal broken, 25 points; total, 67 points. Official weight, 3,690 pounds.

No. 12. Autocar—Points lost: work on spark plugs, 8 points; muffler, 4 points; emergency brake, 4 points; lamp, speedometer and horn loose, 2, 4 and 2 points respectively; seals broken, 50 points; total, 74 points. Official weight, 2,600 pounds.

No. 35. Premier—Points lost: fenders repaired, 18 points; grease cup lost, 4 points; bonnet clip broken, 4 points; replacing fenders, 46 points; fastening seat, 4 points; fastening lamp, 2 points; total, 78 points. Official weight, 2,518 pounds.

No. 15. Dragon—Points lost: one cylinder missing, 50 points; emergency brake, medium, 2 points; steering gear, 6 points; mud apron down, 26 points, shock absorbers, 6 points; total, 90 points. Official weight, 2,240 pounds.

No. 9. Stoddard-Dayton—Points lost: replacing valve spring, 82 points; broken seal, 25 points; total, 107 points. Official weight, 2,755 pounds.

No. 24. White—Points lost: fan blade broken, pump broken, pipe disconnected, 110 points; total, 110 points. Official weight, 3,065 pounds.

No. 22. White—Points lost: steering gear defective, 135 points; lamp loose, 2 points; total, 137 points. Official weight, 3,735 pounds.

No. 8. Stevens-Duryea—Points lost: bent front axle, 174 points; horn loose, 8 points; lamp loose, 4 points; total, 186 points. Official weight, 4,113 pounds.

No. 16. Rapid (12-passenger 'bus)—Points lost: ignition trouble, 54 points; ignition trouble, 16 points; running board, 4 points; mud apron, 2 points; speedometer, horn and lamp, loose and broken, 12 points; broken seals, 100 points; total, 188 points. Official weight, 3,705 pounds.

No. 5. Wayne—Points lost: starting handle loose, etc., 20 points; broken spindle, 600 points; total, 620 points. Official weight, 2,505 pounds.

No. 25. Reo—Points lost: radiator trouble, 134 points; strut rod, 2 points; deck screws, 4 points; radiator, 900 points; total, 1,040 points. Official weight, 1,900 pounds.

No. 13. Maxwell—Points lost: engine work and running gear repairs, 734 points; wheel replaced, 77 points; fan bracket and fan down, 12 points; strut rod, 10 points; broken seals, 275 points; total, 1,108 points. Official weight, 2,122 pounds.

No. 31. Pierce-Racine—Withdrew, third day.
No. 6. Matheson—Withdrew, third day.
No. 7. Matheson—Withdrew, second day.
No. 10. Jackson—Withdrew, second day.
No. 1. Royal Tourist—Withdrew, first day.
No. 26. Matheson—Withdrew, first day.
No. 17. Frayer-Miller—Withdrew, first day.
No. 19. Marion—Withdrew, first day.
No. 21. Thomas—Withdrew, first day.
No. 27. Stoddard-Dayton (six-cylinder)—Withdrew, first day

GOSSIP OF THE BIG SHOW.

Among the hard workers at the annual automobile shows are the advertising managers and publicity experts of the leading concerns. Probably two of the best known and, incidentally, the most industriously sought by the advertising solicitors of the Chicago daily papers, were R. H. Johnston, of the White Company, and A. N. Jervis, of the American Locomotive Motor Car Co. Both were responsible for the placing of considerable publicity, though had they accepted the pressing invitations to invest in the columns of all the dailies they would have made serious inroads into the bank accounts of their companies. There were times when various subterfuges were necessary to sidestep the persistent solicitors, some of whom always seem to be on the trail. H. T. Clinton, of the A. L. A. M. publicity bureau, was another individual whose whereabouts was the source of much concern to the advertising solicitors.

Coming of the Commercial Vehicle.—Robert D. Garden, a well-known figure in the automobile trade, in a show interview in the Chicago *Tribune*, expressed himself regarding the future of the commercial vehicle as follows: "Commercial motor cars will take the lead over pleasure cars in the future in the automobile industry. The commercial car has been neglected because the manufacturers were making plenty of money out of the pleasure car, but the future will develop a great change. The business men of the country are fast being impressed with the utility of the automobile for commercial purposes. There are hundreds of uses to which cars with capacities ranging all the way from one to five tons may be put. In Chicago the time is not far distant when all merchandise delivery and heavy trucking will be done by automobiles, and horses will practically disappear from the streets entirely."

Banquet of the Chicago Automobile Trade Association.—On Friday evening preceding the opening of the show came the banquet of the local trade association, held in the new clubhouse of the Chicago Automobile Club and attended by nearly three hundred. It was the first feast participated in by the clubmen and the dealers, the former having been in the past somewhat indifferent to the trade, though it supplied a substantial part of the membership. President Joseph F. Gunther presided as toastmaster, and the speakers included President Ira M. Cobe, of the Chicago Automobile Club; Dr. W. A. Evans, representing Mayor Busse; M. J. Foreman, Francis Simmons and Chief of Police Shippy. L. C. Boardman talked about good roads, and H. H. Gross told how to get them, while Samuel A. Miles made clear the worth of the show as an educator.

The Gathering of the Pioneers.—At the New Southern Hotel on Sunday night there was held the second annual gathering of the Pioneers, organized in 1906 for the object of uniting the "old timers" of cycling once a year. An eleventh hour notification to members was responsible for a decrease in attendance over that of the previous year, but several score partook of the frugal repast and "reminisced" until nearly midnight. In the election an executive committee of five was designated, consisting of A. G. Batchelder, president; W. M. Harradon, vice-president; George G. Greenburg, secretary,treasurer; N. H. Van Sicklen, and L. C. Boardman. This quintette will do some recruiting and make the third annual a notable affair.

A few days before the opening of the show the local weather-wise man, who has a sanctum in the Auditorium tower, gave vent to an oh-be-joyful stanza. "Wait," said the wise one, "there can't be a Chicago show without snow." And so the event proved, for there were three inches of snow on Saturday; the sun retired for good on Friday, and no one has caught a glimpse of Old Sol since. Even "Joe" Ryan's seductive press work could not bring forth sunshine.

HOW THE BAY STATE AUTOIST IS TAXED TWICE IN A YEAR

BOSTON, Dec. 2.—Though the automobile owners of Massachusetts have not yet recovered from their soreness at being obliged to pay a registration fee of $5 each in the middle of the summer, the Highway Commission is getting ready to give them another prod. This will come in an announcement that on the first of January the commission will be prepared to receive from each owner of an automobile in the State the sum of $5, which will cover registration for the year 1908. In return for the fee the commission will issue a registration certificate and also a brand new set of number plates.

The annual registration law was passed just as the legislature of 1907 was about to adjourn and it was more or less of a compromise measure between the Senate and the House. The Senate wanted a graded horsepower fee, but at the last minute gave in to the House, which desired a flat annual fee. To please the Senate the bill was permitted to go into effect on the first of August. Thus an owner who may have bought a machine in June and registered it for $2 was required to pay $5 more on the first of August, and will have to give up another $5 the first of January. This process naturally met with some opposition, though the law provides that the fund that accumulates from these fees shall go towards road maintenance.

Some of the owners of cars determined not to pay the fee and they have been successful in part, for in the limited time allowed the Highway Commission was unable to secure new sets of number plates. It was therefore necessary to continue to use the old plates, and under these circumstances it has been comparatively easy for persons so inclined to escape paying the fee. The commission has issued lists of owners who did not pay and has put these lists in the hands of the police. This measure has brought in many delayed fees, the total income from registration fees, both original and re-registration, since the new law became effective being $63,875.

With the re-registration on the first of January, however, nobody will be able to escape payment, for the commission has devised a new number plate which is quite different from that which has been used in the last four years. The new plate has blue figures on a white background, instead of white figures on a blue background, and it also bears the numerals "1908" and the letters "Mass." After the first of the year it will be illegal to drive with one of the old plates, so it is expected that there will be a complete round-up of all the owners. The commission has bought 14,000 sets of the new plates and owners who have numbers below 14,000 can retain their old numerals by making application to the commission. Those whose numbers are over 14,000 will be given numbers which have been given up by their original holders.

It is estimated that there are now about 12,000 automobiles registered in Massachusetts. By re-registering these the commission will obtain a gross income of about $60,000, which, added to the $63,875 already received, will provide a fund of $120,875. From this amount the expenses of the automobile department of the Highway Commission are to be paid, and the remainder, which should be in excess of $100,000, will form a road maintenance fund, from which the Legislature may appropriate sums for road work. One-fourth of the fund will be for the uses of the Metropolitan Park Commission, and the other three-fourths for the Highway Commission.

REORGANIZATION OF THE DRAGON COMPANY.

Announcement is made that the Dragon Automobile Company, of Philadelphia, has been superseded by the Dragon Motor Company, a new organization with a capitalization of $1,000,000. The plant of the old company at Thirty-first and Chestnut streets, Philadelphia, will be taken over, and work will be carried on under entirely new lines. Special attention will be paid to the construction of taximeter cabs, 200 of which are declared to be on order, fifty of them being promised in New York City before January. The officers of the Dragon Motor Company are: J. Edward Calhoun, president; A. L. Kull, vice-president; R. G. Kelsey, secretary and treasurer. The directorate includes these officers and H. F. Rawle and C. A. Pickard, president of Salisbury Steel Works.

The factory will be handled by R. G. Kelsey, assisted by John O'Brien. John W. Haynes and J. C. Middleton will remain as assistant sales managers. It is announced that there will be at the present time very little change in the selling organization in the various cities. The A. L. Kull Automobile Company, of New York, will continue as the New York branch, while the Philadelphia and Boston branches, in charge of F. A. Broadhead and George C. Lewis, respectively, will be continued. H. P. Branstetter will remain the Dragon agent in Chicago.

In addition to the taxicab business, the regular touring car and the new roadster model will also be manufactured by the company in considerable quantities.

East Liberty, Pa.—The East Liberty Automobile Company, which was recently burned out, is having plans prepared for the erection of a new garage that will be much larger than the old building, in addition to being of fireproof construction. In the interim, temporary quarters are being occupied next to the ruined building.

ALL READY FOR A GOOD SHOW AT DETROIT.

DETROIT, MICH., Dec. 2.—Everything is in readiness for the show of the Detroit Automobile Dealers' Association, which opens at Riverview park auditorium next Monday, continuing throughout the week. Following close on the heels of the Chicago show, many of the exhibits will be shipped direct by express from that city, thus insuring an exceptional line of cars. It is anticipated that twice as many models will be exhibited as in the past.

The suggestion was made recently that in view of the financial stringency it might be well to declare the show off, or at least postpone it until matters had straightened themselves out. A canvass of the dealers put an effectual quietus on such a move, however, they being unanimous in their determination to carry the original program through. Every foot of floor space in the spacious auditorium, which is in reality a sun garden, the entire sides and roof being glass, thus giving unexcelled light for the purpose, has been taken and dealers are vieing with each other in making their individual displays as comprehensive and attractive as possible.

TEMPORARY RECEIVER FOR BERKSHIRE CO.

PITTSFIELD, MASS., Dec. 3.—Fred T. Francis, of the Berkshire Savings Bank, has been appointed by Judge John C. Crosby, of the Superior Court, temporary receiver of the Berkshire Motor Car Company, of this city. The action was taken at the instance of the company to protect creditors. Liabilities are stated at $35,000; assets at $30,000.

Harmon, Pa.—The Biarritz Auto Garage is the title of the latest addition to the garage facilities of this town. It is located at 337 Franklin street, and is owned and managed by Walter H. Biarritz. The building is modernly equipped and has a well-fitted shop for repair work.

EARLY WINTER DOINGS OF THE AUTO CLUBS

HARRISBURGERS ALIVE TO PRESENT DAY NEEDS.

HARRISBURG, PA., Dec. 2.—By unanimous vote of the Motor Club of Harrisburg, at an enthusiastic meeting at the Board of Trade last Friday evening, it gave a pledge to the Supervisors of Susquehanna township to bear one-half of the township's share in rebuilding as a State road the present Fort Hunter turnpike.

The question of good roads consumed the entire attention of the meeting, and general satisfaction was expressed with the rapid progress in abolishing the present toll road and starting the movement to have it replaced with a splendid macadam roadway. The club also took up the question of better roads throughout Dauphin and Cumberland counties, especially those leading into the city.

The contest committee made its report on the receipts from the automobile races held at Middletown, which showed that nearly $750 was realized to turn over to the club treasury. The contest committee was granted permission to make arrangements for the annual endurance run next May.

The question of affiliation with the American Automobile Association was brought up, but no action will be taken until the annual meeting, when the Motor Club of Harrisburg will apply for membership at the start of the fiscal year of the Pennsylvania Motor Federation, the State organization of the A. A. A.

SEALED BONNET CONTEST FOR CAPITAL CITY.

WASHINGTON, D. C., Nov. 30.—Promoted by a local newspaper and given under the auspices of the Automobile Club of Washington, a sealed bonnet contest will be held December 10 and the indications are it will be the best automobile event Washington automobilists have ever participated in. The route selected is rather a trying one over roads that are good in spots and exceedingly bad in some places. The distance to be covered is 114 miles, starting and finishing at the country home of the Automobile Club of Washington on the Brightwood road. The first leg will be to Olney, thence to Ridgeville, where the National pike will be taken to Frederick, Md. The contestants will then double back over the National pike to Ellicott City, and return to the starting point by way of Ashton and Burnt Mills. There are a number of stiff hills along this route, together with a thousand or more thank-you-mams, and the contestants will have their work cut out from the start.

Entries are coming in freely and the indications are there will be thirty or more cars in the contest. As this is the first event of the kind ever pulled off in the Capital City, interest in it is becoming intense and there is no doubt it will have a very stimulating effect upon automobiling here.

BAY STATE A. A.'S INTERESTING SMOKE TALK.

BOSTON, Dec. 2.—"The Automobile Law, Its Uses and Abuses," was discussed from every conceivable standpoint at the smoke talk of the Bay State Automobile Association at the Hotel Oxford last Saturday evening. There was much of interest and value along this line brought into the full light of the day or rather night, by the speakers on the subject, and if but one-half of the suggestions advanced were adopted, both on the part of the police and the driver of a motor vehicle, there would be fewer arrests recorded.

The speakers included Chairman McClintock of the Massachusetts highway commission, President L. R. Speare, H. D. Crowell and Frank J. Tyler.

Owing to a lack of room in which to hold the smoker at the regular quarters of the club, special arrangements had been made with the hotel people so that the smoker could be held there. This followed close upon the serving of dinner in the club dining rooms, which some seventy-five members attended.

QUAKERS PLANNING TWO-DAY NEW YEAR'S RUN.

PHILADELPHIA, Dec. 2.—The contest committee of the Quaker City Motor Club has decided on a popular innovation in arranging for its next two-days New Year endurance run. This is the conclusion of a "purely-for-pleasure" class, open to anybody and any car, and unrestricted as to schedule and checkers, except that the run must be completed within the time limit each day. And a prize cup will be awarded in the class, too, but car-performance or driver-efficiency will have nothing to do with its disposition, the cup being awarded in perpetuity to the driver in that particular class who is voted the "most popular," only those passengers, observers and drivers in the "purely-for-pleasure" class being entitled to drop a ballot. Already there are many entries from those owners who like to be "on the ground" during a contest, but who fail to extract any amusement from the strain of adhering to a schedule and observing strict rules as to bonnet-raising, adjusting, etc., under the eagle eye of an official observer.

For those who are "out for blood" there will be three classes, with a handsome cup for each. Class A, for which the McDonald & Campbell emblem will be hung up, will be for touring cars carrying four or more; Class B, for the long, low, rakish, high-powered roadsters; and Class C, for small runabouts.

Chairman E. C. Johnson, of the Contest Committee, believes that fully 60 cars will line up for the start at 8 o'clock on New Year's day from the club's quarters at the Hotel Majestic. The first day's run will be via Willow Grove, Doylestown and Easton to Allentown, where the overnight stop will be made. The return trip will be via Hamburg, Reading, Pottstown, and Norristown —the round trip being estimated at a trifle over 200 miles.

"LEGAL SPEED LIMIT" FOR PHILADELPHIANS.

PHILADELPHIA, Dec. 2.—The demand for another "legal speed limit" run has become so insistent that the tours and runs committee of the Automobile Club of Philadelphia is considering the advisability of promoting such an event, to be pulled off possibly on Saturday, December 14. A similar run for the Brazier Cup, about a month ago, was spoiled by a pitiless rainstorm, which not only scared off the bulk of the contestants, but marred the pleasure of those who did start. And then, as a wind-up, the officials first announced the Packard as a winner, and afterwards, on a re-inspection of the scorer's sheets, gave the run to Swain's Apperson "Jack Rabbit." Later a protest against the "Rabbit" for failure to adhere to the scheduled route coming into the city was sustained, and the cup finally awarded to the Ford, which came in second.

The run of the 14th will be open only to club members; with the same rules as obtained in Brazier Cup run as to penalties for passing the hidden checkers ahead of or behind schedule, loss of time through repairs, etc. The cup, which will be hung up by the club, will become the property of the winner.

A. C. OF AMERICA HOLDS MONTHLY DINNER.

NEW YORK, Dec. 4.—A large number of members and guests attended the regular club dinner of the Automobile Club of America last night in the clubrooms, West Fifty-fourth street. A smoker and interesting entertainment followed the dinner. Members of the Aero Club of America, who attended the event in strong force, decided to raise a fund of $10,000 to purchase three balloons and send a team to Germany to compete in the next race for the International Cup. Announcement is made that the Automobile Club of America will hold a ladies' day at the clubrooms on December 17, between the hours of four and six in the afternoon. Tea will be served and members are invited to bring guests. The regular monthly club dinners of the A. C. A. are proving a popular feature.

JEWEL MODEL D, SPECIAL RUNABOUT TYPE FOR 1908.

JEWEL PRODUCES A LARGE TOURING CAR.

After graduating in the small car class, the Forest City Motor Car Company, of Massillon, O., has turned its attention to a more pretentious class of vehicle, the new model, to be known as the Jewel touring car, giving promise of being as popular in its own sphere as its smaller predecessors.

The new touring car, listed as a 40-horsepower model, has as its power plant a four-cylinder Rutenber vertical engine, with bore and stroke 4 3-4 by 5 inches, developing its normal power at 1,000 revolutions, but capable of speeding up to 1,500 revolutions per minute. Cylinders are cast separately with integral water jackets, and valves are all on one side with a single camshaft. On the 1908 model engine a new carbureter is used, made entirely of brass, this metal having proven itself to be better adapted for this work than aluminum. It is of the float feed type, compensated to give a correcte mixture at all engine speeds. A double ignition system has been installed, each one entirely independent of the other. One set of spark plugs is in connection with an imported high-tension Bosch magneto, the other set with a storage battery and four-unit coil, a conveniently located switch allowing a change over from one to the other instantaneously. Engine lubrication also is of the double type, by six-feed mechanical oiler with its self-contained pump.

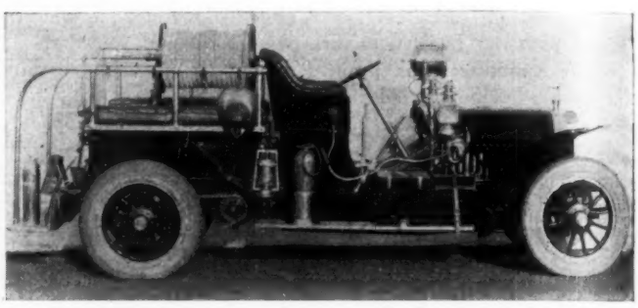
Standard lines of construction have been followed in the transmission, the clutch being of the leather-faced cone type, with a series of springs behind the leather, gear set of the selective sliding type, and final drive by propeller shaft to rear axle. Timken roller bearings are employed throughout in the transmission, and tow ball-bearing universal joints are provided on the propeller shaft. The rear axle is of the Timken full floating type, with the top half of the housing removable to permit of easy inspection of the bearings. Webs are cast at important points inside the housing to give additional strength. Steering gear is of the screw and nut type, spark and throttle levers being held on a quadrant above the steering wheel, but not revolving with it. Semi-elliptic springs are employed in front and platform type in the rear. With a wheelbase of 117 inches there is sufficient room for a comfortable tonneau, capable of containing five people, three being on the rear seat and two on folding seats.

JEWEL 40-HORSEPOWER TOURING CAR—A NEWCOMER.

BRIDGEPORT PROUD OF ITS AUTO FIRE ENGINE.

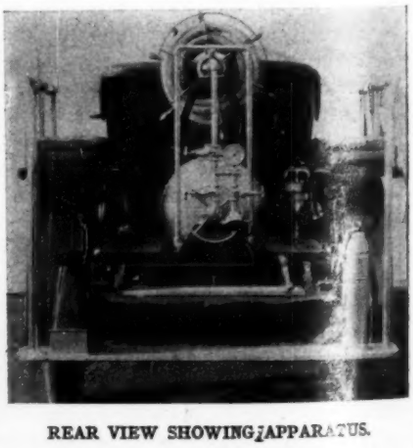
Automobiles as an aid in fighting fire have not been given the attention they deserve, probably as much from the neglect of constructors to tackle the problem of adapting a car for this purpose as from honest conservatism on the part of authorities.

At the Bridgeport factory of the Locomobile Company of America, a special machine has been brought out and has just been delivered to the Bridgeport fire department, which appears to be a highly successful attempt to adapt the automobile to fire service. Though the machine is spoken of as being adapted, it is in reality an entirely original construction, designed specially for the work it is intended to perform. A special four-cylinder 60-horsepower engine is mounted on a strengthened chassis with a wheelbase of 123 inches. Features of the transmission are the same as on the firm's touring cars, but adequately strengthened for the heavier work; they include selective transmission giving four speeds forward and reverse, and final drive by side chains. Total weight of the car is about 4,200 pounds, to carry which load powerful semi-elliptic springs are employed, and wheels are shod with 36 by 5-inch Fisk demountable tires.



BRIDGEPORT'S NEW LOCOMOBILE CHEMICAL FIRE ENGINE.

The bodywork of the new fire fighter, built by the Bridgeport Vehicle Company, is designed to carry eight men, two on the front seats, two on each side and two on the rear, but ten in all can be accommodated if necessary. The machine is equipped with a 50-gallon Babcock chemical tank, hose reel and hose, small hand extinguishers, crowbars, axes, helmets, and other apparatus necessary for fire fighting. Warning signals are an auto chime and a bell, but as the car is capable of a speed of fifty miles an hour, and will always travel at a much faster rate than a horse-drawn engine, some third warning device may be necessary. An interesting feature of the equipment is an electrical apparatus which permits of the lighting of the big acetylene searchlight from the seat without striking a match. Painted red, with the initials B. F. D. on the radiator, the chemical fire engine presents an extremely businesslike appearance. It is now under the direct care of two attendants who received training at the Locomobile factory.



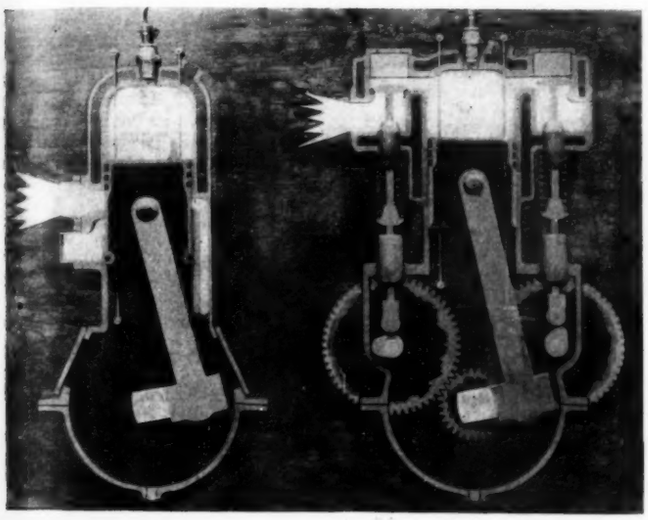
REAR VIEW SHOWING APPARATUS.

CHAUFFEURS' ASSOCIATION IN QUAKER CITY.

PHILADELPHIA, Dec. 2.—The Philadelphia Mechanical Chauffeurs' Association, an organization which first saw the light last spring, has already increased in membership to such an extent that a room was opened last week in Odd Fellows' Temple, where weekly meetings are held for the discussion of live topics and the advancement of the general interests of the association. This association now includes nearly 75 per cent. of the most proficient chauffeurs in the city, and weekly accessions are being made to the ranks. No applicant is received who cannot give evidence of his ability at his chosen occupation, and also satisfy the membership committee of his general character—morals, temperance, etc.

A COMPARATIVE MODEL OF THE "CYCLES."

One of the agents of the Atlas Motor Car Company, of Springfield, Mass., who modestly requests that his name be not published, has sent to the factory for inspection a clever model in wood, showing the salient points of difference between a two-cycle and four-cycle type of engine. This enthusiastic and enterprising agent of the Atlas car, the motor of which is of the two-cycle type, uses the model to clinch his argument in favor of that



UNIQUE MODELS SHOWING TWO AND FOUR-CYCLE OPERATIONS.

type of machine with his customers. The board on which the models are carved and built is hung in a convenient place in his salesroom and, as he puts it, "as soon as the customer shows the least sign of being a 'mental Missourian,' I show the prospective buyer in an unmistakable manner, that as applied to gasoline engines in particular, two solid blows on the head of a nail are more effective than four 'tenderly administered' ones."

TRADE CHANGES IN THE QUAKER CITY.

PHILADELPHIA, Dec. 2.—With the approach of the 1908 season comes the usual announcement of agency changes here. The most important in this connection is the addition of the American Berliet to the list represented locally by the Louis Bergdoll Motor Car Company at 323-327 North Broad street, which now handles the Imperial, Benz, and Welch. Another announcement no less important is that of the Hills Motor Car Company, 130 North Broad street, to the effect that the "full-jeweled" Corbin has been added to its line, consisting heretofore of the Royal Tourist. The Berliet had been represented here before by H. Oscar Brown, at 229 North Broad street, while the Corbin is a newcomer.

George T. Thompson, former manager of the Eastern Automobile Company, one-time representatives of the Stevens-Duryea and Lozier cars, has joined the sales force of the local branch of the Locomobile Company.

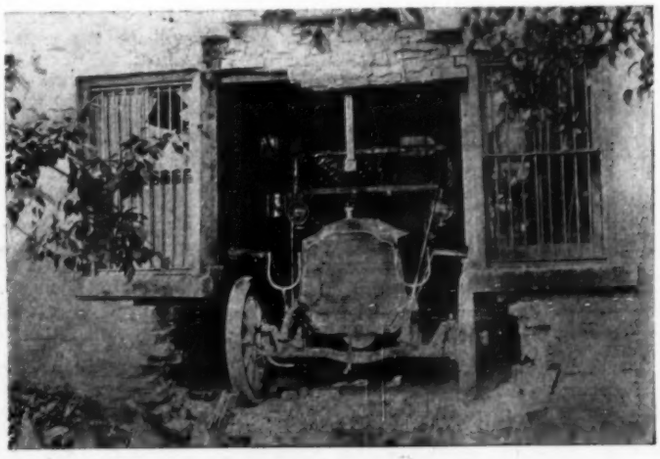
GEN. MANAGER MILES OF THE N. A. A. M. STARTS THE FRANKLIN.

FRANKLIN ON 180-HOUR MARK-TIME RUN.

CHICAGO, Dec. 2.—When Samuel A. Miles had cranked up the 24-horsepower Franklin air-cooled engine at Chicago last Saturday afternoon he did not climb into the drivers' seat, slip in the low and run away, for to have done so would have defeated the ends for which the Franklin people had invited him to display his skill as a chauffeur. The air-cooler has to mark time in the Chicago showroom for exactly seven days and a half, running constantly at a speed which would give thirty miles an hour if the gears were put into mesh. Next Saturday at midnight some one will throttle her down if she has not stopped before—and the Franklin people are convinced that she will not; thus a run equivalent to a trip of 5,400 miles will have been accomplished without a turn of the road wheels. With nothing more refrigerating than the warm air of the showrooms to throw upon the stationary cylinders, the demonstration is strenuous enough to prove the full worth of the waterless car.

WHAT IS TAUGHT AT THE PACKARD SCHOOL.

Most men, when they match their automobile, either willingly or otherwise, against a brick wall, have occasion to sigh over the length of the repair bill. Not so with the owner of a Packard, who, writing from Rochester to the factory, states: "Last night my man ran my car through a brick wall, knocking out the whole side of the barn. There was no injury to the car except smashed lamps and slightly bent mud guards. I am running the car to-day. The gentleman who performed the feat of going through a brick wall without injuring the car is a graduate of the summer class of your chauffeur's school. I presume, therefore, that the instruction in your curriculum includes detailed directions for driving a Packard through a brick wall without scratching the paint off."



WHERE THE PACKARD DELIVERED A KNOCKOUT TO THE WALL.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

A 4 1-2-ton Frayer-Miller gasoline truck has been purchased by Arbuckle Brothers, the big Brooklyn coffee concern.

At the American Michelin Tire Factory in Milltown, N. J., work is now carried on from 7 o'clock in the morning to midnight with a full force of skilled workmen.

The Ralph Temple Auto Company, of Chicago, has recently secured the agency for the Rapid Vehicle Company's line of commercial vehicles in that city, and has placed an order for cars for the season.

Having secured more commodious quarters at 741 Boylston street, H. C. Stratton & Company, Boston agents for the DeLuxe and Kisselkar, will shortly remove thereto from their present location on Huntington avenue.

According to telegraphic advices received by the Gearless Transmission Company, of Rochester, N. Y., a Gearless six-cylinder won the free-for-all in the hill climb at Los Angeles, Cal., on Thanksgiving Day, the time for the 3 4-5 miles being 6:16.

Knight & Wall, the new agents for the Dragon car at Tampa, Fla., will handle the Cuban market, and expect to make shipments of 25 Dragons to that island by January 1. The first consignment has been shipped from the Philadelphia factory.

The Milwaukee Merchants and Manufacturers' Fire and Burglar Dispatch has selected three Rambler cars for use in its service. They will be sent on emergency calls reporting fire, burglary, open safes or vaults, neglected lights, windows or unlocked doors.

Cassius F. Baker, after a trip round the country in the interests of the Pope Motor Car Company, Toledo, O., reports an increased briskness in trade. Money has been tied up, but the drift of opinion is that currency is going to be freer than ever, and that automobile business will be brisk.

As the result of a change of agency the products of the Supplementary Spiral Spring Company are now being handled in Chicago by Page & Palmer, 1712 Michigan avenue. They will have the exclusive agency for their territory, as well as for the States of Michigan and Wisconsin.

With a view to obtaining the European agency for American novelties in automobile accessories, the United Motor Industries, Limited, of London, has commissioned G. H. Smith to visit New York this month. Headquarters in the city from December 26 will be at the Hotel Astor, New York City.

After an extensive Western tour, J. D. Maxwell, designer of the Maxwell car, declares that road manners have considerably improved of late. In almost every case now automobilists will stop upon seeing the raised hand of a horse driver. On several occasions he saw automobiles help pull farm wagons over steep inclines.

The Studebaker Brothers Manufacturing Company, South Bend, Ind., has just been notified by the Jamestown Exposition jury of awards that their exhibit of automobiles, street sprinklers, garbage and dump wagons, contractors' wagons, and trucks, has been awarded a diploma and gold medal for vehicles of that class.

The Autolyte Manufacturing Company, 26 Warren street, New York City, has acquired the automobile department of Sibley & Pitman, at the same address. Mr. Pitman has been elected treasurer and a director in the Autolyte Company. A. H. Funke will continue as manager.

Charles A. Singer, Jr., of the Palmer & Singer Manufacturing Company, of New York, announces that he will take part in the Ormond-Daytona beach races with a Matheson car, and expresses confidence in his ability to lower the record of 50 1-5 seconds for a stock car with seven passengers, established by the late Tom Cooper in a 1906 Matheson.

Foreign appreciation of the Bosch system of ignition is shown by statistics furnished by the makers on the recent London and Paris shows. According to figures given out, 90 per cent. of the exhibiting cars at the Olympia exhibit were equipped with the Bosch magneto, and at the Paris show the proportion of complete cars with Bosch magneto was 68 per cent.

"Opponents of the six-cylinder idea," says Chas. B. Shanks, of the Winton Company, "often argue that if sixes are better than fours, then eights are better than sixes. The statement is unfair, for it is not a question of multiplicity of cylinders but of obtaining results. Eight cylinders, or any other number beyond six, cannot do more than the six in producing continuous power."

The Acme Sextuplet, the new six-cylinder product of the Acme Motor Car Company, of Reading, Pa., is having an excellent sale, according to reports from W. J. Flinn, traveling sales manager for the company. Shipments have been made to San Francisco, Los Angeles, Boston, and Chicago, and Mr. Flinn is to receive this week in New York City the first of the six-cylinder Acme runabouts, with which he will give practical demonstrations in the Eastern States.

Every owner of a Rambler automobile who can furnish proof of having driven his car 15,000 miles is eligible for membership in the Rambler Fifteen Thousand Club. The president of this body must have qualified for membership with the least expenditure for fuel, oil and repairs; the vice-president will be the owner of the oldest Rambler car still in daily service. The second vice-presidency will go to the owner who has actually covered the greatest distance; the secretary must have accomplished the most successful and economical single trip of greatest length, and the treasurer will be the conservative and sane driver who has never been fined for speeding. Rambler owners have caught the spirit of the movement and hundreds of applications are being sent to Thomas B. Jeffery & Company, Kenosha, Wis., for membership.

NEW AGENCIES ESTABLISHED.

The Corbin Motor Vehicle Corporation, of New Britain, Conn., has closed its branch house in the Motor Mart at Boston and placed the local agency with George J. Dunham, at 182 Columbus avenue, who will also handle the Royal Tourist.

Recent agencies appointed for the Corbin Motor Vehicle Corporation include the following: Reese Motor Car Company, Cleveland; Covey & Wallace Motor Company, Portland, Ore.; Pacific Coast Automobile Company, Seattle, Wash.; Inland Auto Company, Walla Walla, Wash.; B. S. Bernard, Troy, N. Y.; Carlton Garage & Repair Company, Brooklyn, N. Y.; Clark & Davis, Syracuse, N. Y.; Wirick-Bennett Auto Company, Sioux City, Ia.; Bell Bros., Stamford, Conn.; Bridgeport Auto Company, Bridgeport, Conn.; New Haven Auto Corporation, New Haven, Conn.; E. H. Towle Company, Waterbury, Conn.; Pyramid Motor Car Company, Danbury, Conn.

PERSONAL TRADE MENTION.

W. W. Burke has resigned as manager of the Motor Parts Company, 25 West Forty-second street, New York City, with future plans not yet announced.

Emil Grossman, president of the National Sales Corporation, of New York City, starts this week for a five or six weeks' business trip through the middle west and far west.

F. C. Lindoerfer, who for the past three months has been associated with the sales department of the Logan Construction Company, Chillicothe, O., has severed all connection with that concern.

Charles A. Davis, formerly with the G & J Tire Company, as Pacific Coast manager, has joined the selling force of the Michelin Tire Company. Mr. Davis will be the special factory representative to the Pacific Coast trade.

E. R. Benson, formerly secretary of the Hartford Rubber Works Company, Hartford, Conn., and head of the sales department, has resigned to accept an important place in the sales department of the Cadillac Motor Car Company, Detroit, Mich.

Oscar Stevenson, of New York City, secretary of the York Motor Car Company, York, Pa., has joined the office staff at the latter city, and will remain for some time to supervise the 1908 output at the home of the Pullman automobile. H. R. Averill, sales manager of the company, is attending the Chicago show during the present week.

C. S. Johnston, treasurer and general manager of the Continental Auto Manufacturing Company, New Haven, Conn., has sold out his entire holdings in that concern, and in future will only be connected with the Continental car in helping to increase its sales when it does not conflict with any other interest that he may take up in the automobile industry.

D. W. Henry, for the past five years a general representative of the Electric Vehicle Company, Hartford, Conn., has just assumed charge of all the agencies of the Columbus Buggy Company, Columbus, O. This company will devote considerable attention to turning out its air-cooled high-wheeler in quantities during the coming season, in addition to its quota of electrics, which will also be increased.

Roy F. York, vice-president and sales manager of the F. B. Stearns Company, has left for the Pacific coast and will visit the numerous new Stearns agencies established throughout the West. Mr. York regards the great west as one of the coming big fields for the sale of high-powered automobiles of the better class. "Our company for some years past has felt a strong and growing demand for cars from the western part of the United States," he said, "and each year a large share of our output is shipped

to western dealers. One result of the success with which Stearns machines have met is the opening of many new agencies throughout the West." All of these will be visited by Mr. York on his trip.

A NEW THOMAS MANAGER.

A valuable addition to the forces of the E. R. Thomas Motor Company, Buffalo, N. Y., has been made in the person of E. C. Morse, recently appointed to take charge

E. C. MORSE.

of the sales department, advertising and commercial end of the business. Mr. Morse comes to the automobile industry with a good reputation as commercial manager with the National Cash Register Company, at Buffalo.

FORD COMMERCIAL MANAGER.

Rapid growth of business has compelled James Couzens, of the Ford Motor Company, to relieve himself of some of the burden connected with the management of the sales department of his concern, and N. A. Hawkins has been appointed to the position of commercial manager, Mr. Couzens being left free to look after general affairs.

N. A. HAWKINS.

Though new to the automobile public, Mr. Hawkins is no stranger to the Ford interest, having in his capacity of auditor and adviser, been closely connected with Messrs. Ford and Couzens since the inception of the company. He is thoroughly familiar with every department of the concern, acquainted with every member of the organization, and will be an invaluable addition to Ford forces by reason of his exceptional ability in organizing and systematizing.

NEW TRADE PUBLICATIONS.

From the Niles-Bement-Pond Company, of New York, comes a well produced illustrated catalogue dealing with the firm's 21-inch and 28-inch rigid turret lathe. Illustrations are given of the lathe on various classes of work, and examples given of various classes of work which can be done.

A six-page folder has been published by the Apperson Bros. Automobile Company, of Kokomo, Ind., calling attention to the fact that out of a total of 73 of the most prominent automobile owners in one of our large cities, as per list selected by a well-known and conservative newspaper, over 40 per cent. had purchased Appersons.

A handsome illustrated pamphlet has just been produced by the Continental Caoutchouc Company, descriptive of the demountable rim introduced by that concern. The invention, which has been named the Continental Ready Flated tire, allows of the carrying of an inflated tire on a separate rim ready to be fixed on the wheel with the delay of but a few minutes whenever a puncture makes a change necessary.

An interesting publication dealing with vanadium steel for use in automobile construction has been sent out by G. F. Ehrenzeller, Pennsylvania Building, Philadelphia, sole agent in the United States and Canada for Willans & Robinson, Limited, of Queen's Ferry, Flints. A valuable comparative table is given, showing average static and dynamic tests of the various steels manufactured at the Queen's Ferry works. The publication will be useful to automobile manufacturers, from the fact that it deals exclusively with steels for automobile work, specific examples being given of crankshafts and axles, springs, forgings and stampings of all sorts, hollow shafts, tubes for frame work, gear wheel blanks and all classes of forgings.

There is much more than mere platitudes in the 60-page instruction book just issued by the Ford Motor Company, Detroit, Mich. The work has been produced to assist owners of 1906 and 1907 Ford models in a complete understanding and care of their cars, and is certainly one of the most complete and valuable publications of its kind ever sent out by a manufacturer. It contains a photographic reproduction of every part, bolt, nut and screw on the 1906 and 1907 models, with complete instructions for the adjustment, removal and replacement of each, the cost of photographing, retouching, cuts and printing alone amounting to about $5,000. As an example of how thoroughly the work is done, for the motor alone there are 98 distinct illustrations, each one numbered and named, and its price indicated. The book is not intended for general publication, but an endeavor is made to obtain the name of every Ford owner and send one to him direct. It is naturally difficult to trace all owners, on account of cars changing hands and other reasons, but a copy will be sent to every person possessing a Ford immediately on receipt of name and address.

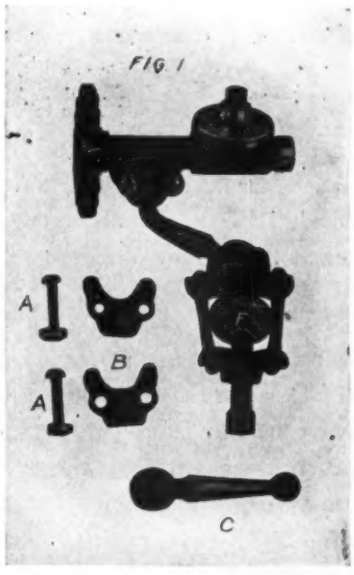
INFORMATION FOR AUTO USERS.

Improved Storage Batteries.—Several new and improved features have been incorporated in the storage batteries produced at the Schug Electric Manufacturing Company's factory in Detroit, Mich. As a protection against breakage, the Schug battery is built with separate rubber jars and protected with an outer case of wood. Instead of using screws and nails to hold the case together, as is often done, maple pins are employed; there is thus nothing to corrode and no danger whatever of the bottom of the case falling out. The cells are joined together with burned-in lead connectors, the terminals being brought over the side of the box. The only metal parts not made of lead are the screws and washers used to fasten the rubber handle or strap to the box, and the brass thumb screw for fastening the wires to the battery. The top of the

THE SCHUG STORAGE BATTERY.

battery is sealed over with a special acid-proof compound. The improved construction increases cost a little, but this is more than regained by the longer life of the batteries. Three sizes are made, 40, 60 and 80 amperes, all 6 volts.

Bullard Speedometer Bracket.—A chain being no stronger than its weakest link, speed indicators have often been considerably diminished in value by the weakness and unsuitability of the method of attaching the cable to the road wheel. What is claimed to be an improvement on any device yet put on the market has been produced by J. H. Bullard, manufacturer of automobile specialties, of Springfield, Mass. The accompanying illustration shows the general design of the Bullard improvement, consisting of a gear



DETAIL OF THE BULLARD BRACKET.

bracket and connections by means of which the speedometer shaft can be connected to the arm of the steering knuckle by the use of only three screws. It is declared that no American machine has yet been found that one of these connections will not fit. Fig. 1 shows the bracket and gear box complete with the driven gear, *AA* being the two bolts that hold the clamps *B* on the small end of the ball-standard and also clamp the neck of the gear box, allowing it to be turned at any angle. The standard *C* is made of the best quality of soft steel and can be bent between the balls at a right angle if necessary, so as to fit where a straight standard could not be used.

THE AUTOMOBILE

PUBLISHERS' SPECIAL ANNOUNCEMENT TO ALL SUBSCRIBERS

NEW SUBSCRIPTION RATE

Owing to extensive improvements in THE AUTOMOBILE, as well as to general increased cost of production, the subscription rates will be

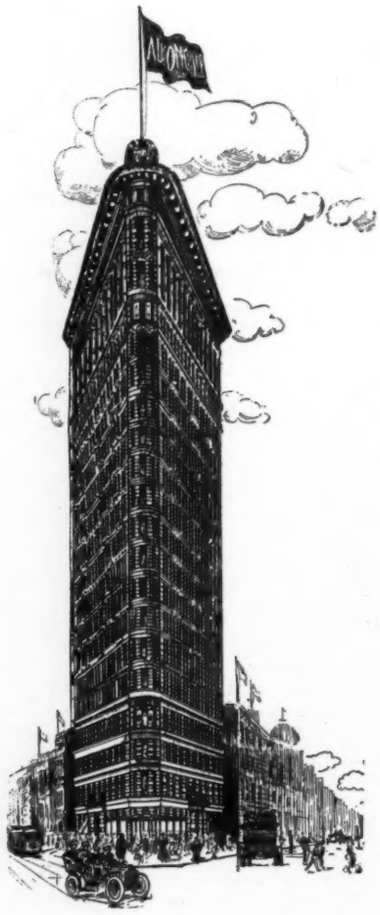
$3.00 A YEAR

after January 1, 1908, and all amounts mailed after that date will be credited at that rate.

All present subscribers and subscriptions mailed before January 1, 1908, may renew for any period from the date of any expiration as shown on the wrapper at the present rate of

$2.00 A YEAR

All subscriptions renewed for 5 years for $10, now paid to some period of 1908 will be credited to January 1, 1914, or all subscriptions expiring this year (1907) may renew to January 1, 1914, by paying $11 before January 1, 1908.



REASON WHY

When the $2 a year price was established in 1902 THE AUTOMOBILE gave its readers 22 editorial pages, with 15 to 20 illustrations.

This year THE AUTOMOBILE gives its readers an average of 40 editorial pages, with 50 to 60 illustrations, at an editorial expense of production per issue of three times the cost of the issues when the price of $2 was made.

THE AUTOMOBILE is ably, conscientiously and efficiently edited. It has a complete staff for both its news and engineering features, and its policy is to reflect in all its phases the great and growing industry for which it speaks.

During these years THE AUTOMOBILE has sold and is selling to legitimate readers many more copies than any other publication in the field.

RENEW AT ONCE

while the matter is before you, avoiding the increased rate for any period covered by your renewal. Improvements in the paper will continue. Time is valuable. You cannot afford to read cheap papers.

THE AUTOMOBILE, Flatiron Building, NEW YORK

Nov. 21, 1907.